



# AGRICULTURAL MARKETING IN INDIA



Report on the

व्यापारिक कृषि  
MARKETING OF GRAM

IN

INDIA

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## INTRODUCTION.

Gram in India, like oats elsewhere, forms an important food crop, both for men and farm-stock, such as cattle and horses. With an acreage of nearly 18 million acres, it covers about 5·3 per cent. of the total cropped area. This report deals with the various problems connected with the marketing of gram and gram products in India. Its main object is to demonstrate the defects in the present system and to show how a larger return can be assured to the producer by effecting economies in distribution, by cutting down the disproportionate margins of intermediaries and by eliminating mal-practices. It is hoped that it will provide useful information to those interested in the improvement of gram trade.

Thanks and acknowledgments are due to a large number of growers, merchants, millers, trade bodies, Government departments and others for their kind co-operation with, and assistance to, the Marketing Staff throughout the country in bringing out this report.

**NOTE.**—The Government of India should not be regarded as assuming responsibility for all or any of the recommendations contained in this report.

**TO THE GENERAL READER: FOR A QUICK GRASP OF THIS REPORT,  
READ THE SUMMARY, CONCLUSIONS AND RECOMMENDATIONS ON  
PAGES 50 to 55.**

CENTRAL AGRICULTURAL MARKETING DEPARTMENT

GOVERNMENT OF INDIA

DELHI

*June 1945.*



## CHAPTER I.—SUPPLY.

### A.—Introduction and historical.

Gram or Bengal gram (*Cicer arietinum*) has been known in India as a cultivated plant for a long time. Though grown fairly extensively in other parts of the world, it is only in India that it occupies a place of pre-eminence, taking the fourth rank in acreage and production among the food grains of the country, after rice, wheat and jowar. In value, it occupies the sixth place, cotton and sugarcane preceding jowar and gram.

In Sanskrit, the pulse is known as *chanaka* or *chennuka* and most modern Indian languages have names for gram closely akin to these words, i.e., *chenna*, *chena* and so on. Other names such as *kadalai*, *harimandakam*, etc., are also prevalent in parts of India. In Arabic, the pulse is known as *humez* and in Persian, *nukhud*, and these names are more popular among Muhammadan writers.

Outside India, the pulse is more commonly known as chick-pea, probably a derivative of the Latin word *Cicer*. Also *aries* in Latin means the ram and as the seed of *chena* resembles the head of a ram, the specific name *arietinum* appears to have been used. In its cultivated form, the chick-pea is known to have existed in Greece and Italy since Homer's time, in Egypt from the earliest times of the Christian era, and from equally ancient times in India. Most authorities are of the view that the cultivated forms of the pulse originated somewhere in the tract of the country between the Caucasus and Himalayas from where they were introduced into Southern Europe, Persia, Egypt and India in very ancient times.

The stem and leaves of the plant as well as the pods are clothed with glandular hairs which produce an acid secretion containing, more especially when the crop is in flowers, a noticeable proportion of oxalic acid. This is said to cause itching if it comes into contact with a part of the human body and is also considered to be injurious to the leather shoes of those who walk in gram fields. The fluid is claimed to have medicinal properties and in some parts of India, it is systematically collected by means of a cloth spread over the plant overnight.

The superior varieties of gram seed with yellowish and whitish colours are generally preferred for use in the kitchen and in bakeries. The darker varieties being cheaper, are used for feeding cattle. The important usages of gram in India and the quantities so employed will be discussed in greater detail in a subsequent section of this report. Here, it would suffice to say that apart from gram seed, gram straw is used as fodder. The young tops are also collected and eaten as a vegetable or alternatively sun-dried and preserved for cooking at a future date.

### B.—World production and trade.

As stated already, gram is cultivated only in a few countries, viz., those included in the tract extending from South-East Europe up to India, in Egypt and certain other African countries, and in Mexico in the New Continent. No published data are, however, available regarding the acreage, production and channels of consumption in these countries. Nevertheless it seems fairly clear that nowhere else in the world is the chick-pea considered to be of such economic importance, as in India. Watt\* mentions that efforts to introduce this crop generally into countries in Europe as a food for horses were not encouraging, as the animals developed poisonous effects. He, however, expresses the belief that pure gram may not have been employed for these trials. The United States of America Year Book of Agriculture, 1937, refers also to more recent attempts to grow the chick-pea in the Western United States of America, which have not, however, met with much success. But it adds that, as far as was known, no attempts were made to develop superior varieties adapted to the United States of America, though the chick-pea was known to be variable and could, therefore, be improved by selection. It is, however, interesting to note that the improved type F-8 of the Punjab which has been found resistant to gram blight, was evolved from seeds recently imported from the United States of America.

### C.—Indian production.

#### (I) NOTE ON STATISTICS RELATING TO GRAM.

As with other agricultural commodities, the principal official publications dealing with agricultural statistics relating to gram are the "Agricultural Statistics of India" and the "Estimates of Area and Yield of Principal crops in India". Their chief shortcomings have already been indicated in the marketing survey Reports on Wheat† and Rice‡. These official publications furnish even less complete data for gram. Separate enquiries reveal that the "Agricultural Statistics of India" which

\* The Commercial Products of India, by Sir George Watt.

† Pages 8—10. ‡ Pages 4—5.

is generally comprehensive in regard to crop acreages, omits the acreage under gram in certain Indian States which together account for nearly 4·4 per cent. of the total Indian area. The publication does not also give separately the irrigated and unirrigated acreages under gram. The figures regarding gram given in the "Estimates of Area and yield of Principal Crops in India", is even less representative, as statistics of all-India acreage and production omit a majority of the most important gram producing Indian States, which together account for some 4·1 per cent. of the total Indian production. The publication does not also give information regarding world acreage and production of gram.

Another difficulty regarding gram statistics is on account of the loose manner in which the word "gram" is used and interpreted in certain parts of India. Technically, the name is faulty as it is probably derived from the Latin root "grao" meaning grain, while gram is really a pulse. However, throughout North India, gram is commonly understood as referring to the pulse botanically known as "*Cicer arietinum*". For other pulses, the public in these parts generally use the equivalent terms in the local Indian languages. On the contrary, in the South of India, principally in Madras and Mysore, the word is used as a general suffix for almost all pulses, the different ones being indicated as "Horse gram (*Dolichos Biflorus*)", "Red gram (*Cajanus Indicus*)", "Black gram (*Phaseolus Mungo*)" and so on. Naturally the statistical returns regarding gram emanating from these areas are likely to be faulty, unless a distinct attempt is made to restrict the term "gram" as only referring to the pulse *Cicer arietinum*.

There are no separate statistics for exports and imports of gram products like *dal* and *baisin* (gram flour) as these are included in the general sub-class "other sorts" under the figures relating to the various grains, pulses and flours. Wherever possible, rough estimates of production of and trade in these products have been included in this report but as gram occupies an important place among the food grains of India, it would be in the best public interests if more precise figures were made available.

There are no all-India forecasts for gram such as exist for rice, wheat, etc. Some of the Provincial agricultural departments, however, issue forecasts. Thus the Punjab Agricultural Department issues two forecasts for gram alone, a preliminary one in December and a final forecast in April-May. Three other provinces, viz., Bihar, Bengal and Orissa, also issue common forecasts for all *rabi* crops including gram which are published during April and May. In Bihar and Orissa, wheat and oil-seeds are omitted from these, as separate forecasts are issued for them. It is noteworthy that the United Provinces which produces more gram than any other province or State does not issue any forecast for this crop.

## (2) CULTIVATION OF GRAM IN INDIA.

(a) *General*.—Gram is an easily cultivated crop. Some preliminary cultivation is however beneficial as it opens up and aerates the soil, both of which are very important for gram. The crop does not otherwise require much inter-culture, as its spreading habit is very helpful in choking off weeds.

It is, however, a delicate crop and is not so certain as wheat or barley. As such it is frequently affected by frost and moist atmosphere at the flowering stage which definitely retard the setting of grains and at times cause the wilting of the plant also. Heavy rains during the period of growth are also not desirable as they promote incrustations in the soil which interfere with the aeration and nodular development of the plant. The uncertain nature of the crop is further accentuated by the fact that a major portion (84 per cent.) of this crop is grown dry.

In India, the cultivation of gram is mainly confined to the upper basins of the rivers Indus and Ganges and the adjacent tracts of the Central India and Central Provinces. Watt\* points out that a line drawn from Bombay to Patna would approximately divide India into two sections, the northern one being the great gram area and the Southern in which gram is a very subordinate crop.

Howards† and Khan have established that there is a close relationship between the distribution of gram acreage in India and the soil requirements of this plant. According to them, gram yields the best returns on light, high-lying, well-drained soils which are not in good condition as to fertility. On heavy moisture-retaining soils, there is at first a good vegetative growth but after flowering, leaves fall and there is little setting. When up-rooted, the plants show superficial rooting and poor nodular development. The decreasing tendency in the gram area in the Gangetic alluvium as one passes from the Western United Provinces to the Western boundaries of Bengal is thus to be attributed to the gradual transition in the soil from the sandy, open, well-drained loam to an exceedingly fine silt of high moisture-retaining capacity. For the same reason, in the Punjab, gram does best on sandy soils to the south-east of the province, rather than in the canal colonies where the soil is finer. In Bombay and the Central Provinces, it thrives well on the black soil as the cracking gives good aeration to the roots. In Bombay-Deccan, when irrigated, the crop does well on a black soil of medium quality and fair depth, resting on *murrum* which provides excellent underground drainage.

(b) *Rotation and mixed cropping*.—Being a leguminous crop capable of fixing nitrogen in the soil under aerobic conditions, a rotation of gram with other crops like *kharif* millets (*jowar*, *bajra*, etc.),

\* The Commercial Products of India, by Sir George Watt.

† Some varieties of Indian Gram (*Cicer Arietinum* L.) by Howard, Howard and Khan. Memoirs of the Department of Agriculture in India, Vol. VII, No. 6, December 1915.

rice and *rabi* cereals (wheat, barley, etc.) is much valued in many parts of India. In parts of the Punjab and Western United Provinces, rotation with millets like *jowar* and *bajra* is, therefore, fairly common in the irrigated areas. In Sind also, gram is always raised as a single crop. There are two systems of cultivation. Under the *dubari* (i.e., a second time) system, gram is raised with the help of the residual moisture present in the soil after harvesting the *kharif* crop (generally rice, but some times also *jowar* or *bajra*). In the *khas* (literally, wetting) method, the gram field receives a heavy soaking before sowing, either through river inundation or canal irrigation and the crop is allowed to mature on the moisture so provided. Occasionally one or two additional irrigations are also given after sowing.

In Bombay, gram usually forms the main *rabi* crop, but it is occasionally grown as border crop with *rabi jowar*. In H. E. H. the Nizam's Dominions and Madras, the common practice is to rotate it with a *kharif* millet like *jowar* and *bajra*.

A more common method of raising gram, especially in the United Provinces and the Central Provinces and Berar and in Bihar, is to sow it as a mixture with *rabi* cereals, pulses and oilseeds. The advantage of such mixture is that gram not only serves as a fertiliser but comes up well even when the rains fail, so that the cultivator is assured of some return at least.

(c) *Seasons of sowing and harvesting*.—Gram is a winter annual and is generally sown and harvested about a fortnight earlier than wheat. In the United Provinces and Bihar, as in the case of wheat, sowing of gram starts a fortnight earlier than in the Punjab and North-West Frontier Province. In the Central Provinces and southern parts of the country, the crop is seeded as late as November. The growing period varies from four to six months. In the north where the climate is cooler, the crop takes five to six months to mature—October-November to March-April—while in the Central and Southern India, the growing period is only four months—November to February.

### (3) ACREAGE.

(a) *Total*.—Appendix I gives the total acreage under gram in the various provinces and States of India during the past 20 years. The average of the triennium ending 1938-39, including 812,000 acres from unreported areas is, about 18.9 million acres for the whole country. This comes to roughly 5.2 per cent. of the total area under all crops. Of the total gram area, British India accounts for 72.4 and the balance is located in the Indian States. The share of different trade blocks is shown in the following table and is illustrated in the diagram facing page 2.

Area under gram in different trade blocks.  
(In thousand acres.)

Trade block.	Average 1935-37 to 1938-39.	Percentage to total.	1939-40.	1940-41.
United Provinces	5,972	31.6	5,463	5,161
British	5,910	31.3	5,399	5,106
States	62	0.3	64	55
Punjab	4,752	25.2	3,133	4,525
British	3,655	19.4	2,413	3,450
States	1,097	5.8	720	1,075
Bihar	1,362	7.1	1,454	1,452
Central Provinces	1,221	6.5	1,045	1,186
British	1,191	6.3	1,012	1,152
States	30	0.2	33	34
(Unreported.)				
Bombay	785	4.2	663	695
British	636	3.4	517	585
States	149	0.8	146	110
Reported	62	0.3	60	36
Unreported	87	0.5	86	74
Sind	370	2.0	411	424
British	335	1.8	374	389
States	35	0.2	37	35
Bengal	288	1.5	310	319
North-West Frontier Province	155	0.8	109	138
Madras	65	0.3	69	69
British	62	0.3	66	66
States	3	Neg.	3	3
Delhi	41	0.2	25	22
Assam (Unreported)	3	Neg.	3	3

## Area under gram in different trade blocks—contd.

Trade block.	Average 1936-37 to 1938-39.	Percentage to total.	1939-40.	1940-41.
Orissa . . . . .	25	0.1	27	27
British . . . . .	7	Neg.	9	8
States . . . . .	18	0.1	18	19
(Unreported).				
H. E. H. the Nizam's Dominions . . . . .	1,243	6.6	1,239	1,127
Rajputana . . . . .	941	5.0	722	952
British (Ajmer-Merwara) . . . . .	19	0.1	3	21
States . . . . .	922	4.9	719	931
Reported . . . . .	806	4.3	642	729
Unreported . . . . .	116	0.6	77	202
Central India States . . . . .	1,617	8.7	1,461	1,499
Reported . . . . .	1,059	5.7	982	1,076
Unreported . . . . .	558	3.0	479	423
Mysore . . . . .	37	0.2	33	39
Kashmir . . . . .	3	Neg.	3	3
Grand Total	18,880	100.0	16,170	17,641
Total British India . . . . .	13,664	72.4	11,694	12,711
Total Indian States . . . . .	5,216	27.6	4,476	4,930
Total Reported Area . . . . .	18,068	95.7	15,474	16,886
Total Unreported Area . . . . .	812	4.3	696	755

It will be observed that 812,000 acres or about 4.3 per cent. of the total gram area are not reported. About 3,000 acres of these are in Assam and the rest in Indian States. Central India has about 558,000 acres of such area, Rajputana 116,000 acres and the Western India, Deccan and Gujrat States and the Eastern States have the remainder. Among the individual states, Rewa, and Datia in Central India and Jodhpur in Rajputana have about 98,000, 75,000 and 35,000 acres under gram respectively (see Appendix II). It will also be seen that the gram acreage in British India is concentrated in the United Provinces, the Punjab, Bihar and the Central Provinces which together contribute about 64.1 per cent. of the total gram area. Among Indian States, H. E. H. the Nizam's Dominions, Gwalior and Patiala are important. Among groups of States, the Punjab, Rajputana and Central India States record as much as 19.4 per cent. of the total. The map facing page 3 shows the areas where gram acreage is most concentrated. The salient features of the more important producing tracts are, however, discussed below :—

*United Provinces.*—The Bundelkhand region and the whole of the tract enclosed between the Jumna and Ganges (from Meerut up to Allahabad) accounts for nearly 50 per cent. of the acreage in this block. Oudh and Rohilkhand tracts contribute some 35 per cent. while the bulk of the balance is distributed between the two eastern divisions of Benares and Gorakhpur.

About 40 per cent. of the gram crop of this province is estimated to be grown pure. Of the balance, mixtures with wheat and barley account for about 20 per cent. each while the remaining 20 per cent. is under mixtures with peas, linseed, etc.

*Punjab.*—There are two distinct tracts of concentrated production in this block, viz., a main block to the south-east and a much smaller one to the north-west. In the first tract, Ferozepore and Hissar districts are the largest producers accounting for nearly half a million acres in each case and together contributing 27 per cent. of the total provincial acreage. Barnala in the Patiala State, Karnal, Rohtak and Gurgaon are other important producing districts in this tract, recording about 2 lakh acres in each case. In the north-western tract, Mianwali and Shahpur are the chief producing districts each accounting for over 2 lakh acres.

In the Punjab, while irrigated gram is usually sown pure, nearly half the *barani* crop is sown mixed with wheat or barley in proportions varying from district to district. For the block as a whole, it is estimated that about two-thirds of the total gram area is under pure gram. The balance is under mixtures with wheat and barley, wheat and gram mixture forming about two-thirds of the total mixed crops.

It will be observed from Appendix I that there has been a decline in the acreage under gram in the Punjab since the year 1937-38. The causes for this will be discussed later but in no other

district has the fall been as marked as in Hissar. The acreage in this district dropped from a high figure of nearly 6½ lakhs in 1937-38, to a lakh and one third in 1938-39, and to a little under 50,000 in 1939-40. As against Hissar, Ferozepore did not record such a precipitate fall, the corresponding figures for the 3 years being 5½, 4½ and 3½ lakhs respectively. This is due to the fact that a good proportion of the gram crop in Ferozepore is irrigated, but in Hissar it is mostly unirrigated. In the latter case, failure of rains in the years mentioned was, therefore, responsible for a greater reduction in area.

*Bihar.*—Shahabad, Patna, Gaya and Monghyr are the chief producing districts in this province and together account for nearly 70 per cent. of the total provincial acreage. Each of them has over 200,000 acres under gram. In this province, gram is raised mainly as a mixture with wheat, barley, linseed, mustard and castor, the proportion of gram in the mixture varying from one-third to half.

*Central Provinces.*—Hoshangabad and Jubbulpore districts account for over 2 lakh acres each while Chhindwara and Saugor record more than a lakh acres each. Betul and Mandla districts follow, with over 50,000 acres in each. The above districts among themselves register about 72 per cent. of the total area under the crop.

In the dense producing area to the north of the province, gram is frequently grown as mixture with wheat (known as *birra*) or with linseed. In districts where the *rabi* crop is cotton or *jowar*, e.g., Berar, mixtures are not, however, considered necessary. On an average (1934-35 to 1938-39), it was found that 75·5 per cent. of the total gram acreage of the province was under single crop, 22·8 per cent. under a mixture of wheat and gram and the small balance under a mixture of linseed and gram.

*Bombay.*—Gram cultivation in this province is mainly concentrated in the Deccan (about 4 lakh acres), and in the Karnatak and Gujarat tracts (about one lakh each). In the Deccan, Nasik, Satara, Ahmednagar and Poona districts account for over 75,000 acres each, and the balance is grown in the Sholapur and West Khandesh districts. In the Karnatak, the acreage is distributed more or less equally between the districts of Belgaum, Dharwar and Bijapur. The Broach and Panchmahals district of Gujarat contribute a little under 50,000 acres of gram and the balance is concentrated mainly in the Ahmedabad district.

*Sind.*—The chief producing districts in this province are Upper Sind Frontier (above 128,000 acres), Sukkur (about 128,000 acres), Larkana (53,000 acres) and Dadu (17,000 acres). Together they make for about 96 per cent. of the provincial acreage.

*Bengal.*—Out of a total provincial acreage of nearly 271,000 acres the districts of Murshidabad and Nadia account for about 102 and 95 thousand acres, i.e., 37½ and 35 per cent. respectively. Other producing districts of importance are Rajshahi, Pabna and Malda, each of which has over 10,000 acres.

*Other provinces.*—The cultivation of gram in other British Indian provinces is not of much importance. The North-West Frontier Province has nearly 160,000 acres under this crop, the bulk of which is in the Bannu district while a smaller portion is in Dera Ismail Khan and Kohat. Madras has only about 87,000 acres under gram, out of which the three ceded districts of Bellary, Kurnool and Anantapur account for 13, 11 and 7 thousand acres respectively.

*Indian States.*—In H. E. H. the Nizam's Dominions, the districts of Aurangabad, Bidar, Gulbarga, Osmanabad, Parbhani and Raichur have over a lakh acres each under gram.

(b) *Irrigated and unirrigated.*—Appendix III gives separately the irrigated and unirrigated area under gram in the Punjab, the United Provinces and Bombay during the last few years. Such separate figures are published in the seasons and crop reports of the Punjab and the United Provinces only. Similar reports of other provinces give only combined figures. It is estimated that in the Central Provinces the area under irrigated gram is about 5,000 acres, i.e., 0·4 per cent. of the total, while in Sind about 10 per cent. of the total gram acreage is irrigated. No such estimates are available for Bihar but it is stated that the gram crop is mainly irrigated in the Patna Division (Patna, Gaya and Shahabad districts). In Bengal, Madras and Orissa, gram is grown as a dry crop. On the basis of these data, it is estimated that the average irrigated gram area for the quinquennium ending 1939-40 does not exceed 3 million acres, i.e., about 16 per cent. of the total.

In the Punjab, gram is irrigated chiefly in the Ferozepore district (about 2 lakh acres) and to a smaller extent in Lyallpur, Montgomery, Lahore and Amritsar districts. In the Hissar and Rohtak districts the crop is mostly unirrigated being 14·7 per cent. and 41·7 per cent. respectively of the total. In the United Provinces, 40 per cent. (about 250,000 acres) of the total gram area in the Agra Division is irrigated, while the Allahabad and the Jhansi divisions record about a lakh and half acres of such crop each. In Bombay-Deccan, gram is generally irrigated either as a main crop, or as a catch crop in sugarcane fields. Most of the Indian States raise gram as dry crop.

(c) *Fluctuations and trend.*—It will be observed from Appendix I that there have been wide fluctuations during the past 20 years, in the acreage for both the whole of India and British India. The diagram facing page 4 also illustrates this.

Moderate to copious rains in August-October generally portend an increase in the *barani* area under gram, while dry weather causes a heavy contraction. The marked increase in the total Indian acreage during the years 1924-25, 1931-32 and 1933-34 and the sharp declines in 1920-21 and 1929-30 were primarily due to favourable and unfavourable weather conditions. Three other factors also influence gram sowings, viz., (i) the prevailing price of gram in relation to certain other crops grown in the same season, chiefly wheat and linseed, (ii) the success or otherwise of the *khari* sowings, and (iii) incidence of diseases like gram blight.

It will be seen from Appendix I that between themselves the United Provinces and the Punjab have been accounting for nearly 60 per cent. of the all-India acreage. But whereas the acreage in the United Provinces has been generally steady during the last 20 years varying between 5 and 7 millions (1920-21 and 1929-30 have been omitted, as they were bad years for the entire crop in India), the variation has been wider in the Punjab, viz., between a little over 2 millions in 1938-39 and nearly 6½ millions in 1933-34. This is mainly because seasonal conditions in the Punjab are far more fickle than in the United Provinces. Further, the gram area in the former province is concentrated in districts like Hissar, Rohtak, etc., where rainfall is very low (almost *nil*) in certain years. Evidence also goes to show that during the last few years (1937-38 to 1939-40), the incidence of gram blight had been far more severe in the Punjab than elsewhere. However, judging from the figures of 1940-41, the Punjab acreage seems to be improving again, but it may take a few more years before it reaches anything like the acreage that prevailed in the quinquennium ending 1934-35.

In Bihar, the acreage has generally been steady during the last few years. In the Central Provinces, also, the position has been very much the same, although the average acreage for the quinquennium ending 1939-40 shows a decreasing tendency as compared with that during the preceding quinquennium.

In India as a whole, the gram acreage does not show either a rising or a falling trend.

#### (4) PRODUCTION.

(a) *Methods of estimation.*—As in the case of other crops, the total production of gram in India is estimated from three factors—area, standard yield and a percentage representing the condition of a particular season in relation to the normal for the tract. In the Wheat Report\* it has already been emphasized that the figures employed for each of these factors are in practice very much divorced from realities so that the result obtained is usually a serious under-estimate. These observations apply equally to gram.

(b) *Yield per acre.*—The average yield per acre of gram in the chief producing tracts of India is given in the following table. The figures are based on the data for the decennium ending 1939-40.

Name of Province/State.	Average yield per acre (In lb.)
(i) <i>Indus basin</i> —	
Punjab . . . . .	451
Sind . . . . .	320
(ii) <i>Gangetic basin</i> —	
United Provinces . . . . .	622
Bihar . . . . .	734
Bengal . . . . .	659
(iii) <i>Central India</i> —	
Central Provinces . . . . .	401
(iv) <i>Deccan</i> —	
Bombay . . . . .	360
H. E. H. the Nizam's Dominions . . . . .	358
Madras . . . . .	351
All India . . . . .	503

It will be observed that the average yield is highest in the Gangetic basin (between 622 and 734 lb.), followed by the Punjab (450 lb.) and the Central Provinces (about 400 lb.). The Deccan gives the lowest yield of about 360 lb. The high yields in the Indo-Gangetic plains are mainly due to better soil and/or seasonal conditions, and partly due to the fact that a comparatively larger proportion (about 20 to 25 per cent.) of the crop in this tract is irrigated.

\* Report on the Marketing of Wheat in India, pp. 8-10.

Irrigated land always gives a higher yield per acre than unirrigated. The following table of standard yields per acre in certain provinces for the quinquennium ending 1936-37 illustrates this point.

*Standard yields per acre.\**  
(In lb.)

Province.	Irrigated.	Unirrigated.
United Provinces . . . . .	900	750
Punjab . . . . .	733	530
Bombay . . . . .	1,153	408
Delhi . . . . .	738	562
Sind . . . . .	652	514
North-West Frontier Province . . . . .	602	410

It will be observed that irrigation accounts for a much larger difference in the yield in Bombay than in other provinces.

Except in the Punjab, no records are maintained showing separately the yield of gram actually obtained from year to year on irrigated and unirrigated crops. In this province, for the decade ending 1939-40, the average yield on irrigated land was found to be 620 lb., as against 382 lb., on unirrigated land. Both these figures fall short of the latest standard yield for this province, probably because either the latter has been pitched high, or the published data from which the average has been worked out under-estimate the production. It may, however, be noted in this connection that the yield of gram was much below the normal in the south-eastern part of the province—the main gram producing tract where the crop is usually grown dry, in 1937-38 to 1939-40 on account of famine conditions caused by the failure of monsoon.

The following table shows the extent of variation in the yield of gram in the Punjab under irrigated and unirrigated conditions during the same decade.

*Average yields in the Punjab.*  
(lb. per acre.)

	Average.	Minimum.	Maximum.
Irrigated . . . . .	620	582	713
Unirrigated . . . . .	382	291	438

The calculated average yields of gram for the whole of India during the decade ending in 1939-40 are given in the following table.

*Average annual yield of gram in India.†*  
(In lb. per acre.)

Years.	Average.	Years.	Average.
1930-31 . . . . .	500	1936-37 . . . . .	523
1931-32 . . . . .	476	1937-38 . . . . .	502
1932-33 . . . . .	487	1938-39 . . . . .	489
1933-34 . . . . .	454	1939-40 . . . . .	567
1934-35 . . . . .	520	Average . . . . .	503
1935-36 . . . . .	515		

In his articles‡ “*Cicer arietinum*” Sir George Watt has suggested that for the whole of India, the average yield may be taken at 600 lb. He bases this figure on the crop for the year 1901-2. Compared to this estimate, the average yield of gram appears to have gone down during the last decade. No figures are unfortunately available regarding yields of gram in foreign countries, which can be compared with the Indian average.

\* Quinquennial Report on the average yield per acre of principal crops in India, 1936-37.

† Estimates of Area and Yield of Principal Crops of India.

‡ The Commercial Products of India, by Sir George Watt.

(c) *Total production.*—As stated already, total production is arrived at by multiplying area by yield per acre and naturally the figure of production varies according to the relative variations in the area and yield per acre from year to year.

As has already been referred to, long range data of production are available in a published form only in the case of the British provinces and a few Indian States. In respect of other States, estimates have been made by special local enquiries. In many cases, they are estimates made by the local Agricultural or Revenue Departments and cannot be considered as very accurate. The production of gram in the various provinces and States of India is given in Appendix IV for States which publish their statistics and in Appendix V for those which do not. The relative importance of the various trade blocks in the total Indian production is summarized in the table below. It is also illustrated in the diagram facing page 2.

*Production of gram in different trade blocks.*

(In thousand tons.)

Trade block.	Average 1936-37 to 1938-39.	Percentage to total.	1939-40.	1940-41.
United Provinces . . . . .	1,702	39.2	1,698	1,577
British . . . . .	1,686	38.7	1,678	1,560
States . . . . .	22	0.5	20	17
Punjab . . . . .	949	21.0	685	940
British . . . . .	656	15.1	499	700
States . . . . .	293	6.8	186	240
Bihar . . . . .	439	10.1	459	468
Central Provinces . . . . .	206	4.8	199	200
British . . . . .	203	4.7	196	197
States (Unreported) . . . . .	3	0.1	2	2
Bombay . . . . .	113	2.6	107	120
British . . . . .	91	2.1	78	96
States . . . . .	22	0.5	29	24
Reported . . . . .	8	0.2	13	10
Unreported . . . . .	14	0.3	16	13
Sind . . . . .	55	1.3	55	54
British . . . . .	51	1.2	49	50
States . . . . .	4	0.1	6	4
Bengal . . . . .	79	1.8	84	76
North-West Frontier Province . . . . .	27	0.6	20	7
Madras . . . . .	12	0.3	14	14
British . . . . .	12	0.3	14	14
States . . . . .	Neg.	Neg.	Neg.	Neg.
Delhi . . . . .	14	0.3	5	6
Assam (Unreported) . . . . .	1	Neg.	1	1
Orissa . . . . .	7	0.2	5	5
British . . . . .	2	0.1	2	2
States (Unreported) . . . . .	5	0.1	3	3
H. E. H. the Nizam's Dominions . . . . .	197	4.5	198	165
Rajputana . . . . .	273	6.3	294	319
British (Ajmer-Merwara) . . . . .	5	0.1	Neg.	3
States . . . . .	268	6.2	294	316
Reported . . . . .	238	5.5	232	253
Unreported . . . . .	30	0.7	21	63
Central India States . . . . .	258	6.0	256	268
Reported . . . . .	185	4.3	188	194
Unreported . . . . .	73	1.7	68	74
Mysore . . . . .	6	0.1	4	4
Kashmir . . . . .	Neg.	Neg.	Neg.	Neg.
Grand Total . . . . .	4,338	100.0	4,101	4,290
British India . . . . .	3,259	75.1	3,086	3,180
Total Indian States . . . . .	1,079	24.9	1,015	1,110
Total Reported . . . . .	4,207	97.0	3,990	4,134
Total Unreported . . . . .	131	3.0	111	156

It will be seen from the above table that the total annual production of gram in India amounted to about 4.3 million tons during the triennium ending 1938-39, of which 75.1 per cent. was produced in British India and the rest in Indian States. This includes about 131,000 tons (3.0 per cent. of total) produced in areas not reporting the acreage and production of gram. Of these 130,000 tons are produced in Indian States and about 1,000 tons in Assam. It will also be observed that the United Provinces produces more than 39 per cent. of the total production, followed by the Punjab (21.9 per cent.) and Bihar (10.1 per cent.).



Amongst the other trade blocks, the production of gram is the largest in the Rajputana, Central India States and H. E. H. the Nizam's Dominions, being 6·2, 6·0 and 4·5 per cent of the total respectively.

(d) *Trend of production.*—In the absence of long range data for the whole country, the production in British provinces during the last 20 years has been taken to indicate the trend of the total Indian production. Appendix VI and the diagram facing page 5 show the variations in production during different years. It will be seen that the fluctuations in production are wide and on the whole correspond to those of acreage, although in certain years acreage and production show opposite tendencies. For example in 1924-25, the area under gram increased but production decreased, while in 1929-30, the position was just the reverse.

Since gram is grown mainly as a dry crop and only a small portion (about 16 per cent.) is irrigated, the production of gram depends mostly on weather conditions. Disease, frost and the time of sowing also affect the production to a certain extent. These explain why the trend of production is so irregular.

#### (5) TYPES, VARIETIES AND ACREAGE UNDER DIFFERENT TYPES.

(a) *Indigenous varieties.*—The bulk of the gram crop in India is under indigenous varieties, the improved ones produced by the Agricultural Departments occupying only a small portion of the total area.

The different varieties are usually distinguished by the colour of the grain. This is because "the colour of seed in gram varies to a certain extent in the same plant and even in the same pod according to maturity, but the colour of mature grains is a very good constant character"\*. A lighter colour usually commands a higher price.

Apart from colour, other factors such as size, uniformity, richness of grains and its soundness are also used as tests of quality. But no systematic attempt appears to have been made to classify the more important gram types on the basis of these qualities. In internal trade, each market has got its own quality which goes by the name of *dara* (fair average quality), of that market.

Local names are even more confusing when considered in relation to the colour of the grain. In the first place, there are very few qualities the grains of which conform to a single colour. Only the *Kabuli* or white gram varieties approximate to anything like more than 90 per cent. purity and these usually sell dearer as compared with other varieties. The area under white gram is, however, small. Most commercial varieties are mixtures of more than one colour, although one colour, usually a shade of brown, predominates. In the market, however, a lot of confusion exists; what might pass as "brown" in one market might be called "*Peela*" or yellow in another.

An attempt was made by the Central Agricultural Marketing Department in 1936-37 to make certain broad classifications of different varieties of gram. Local Marketing Staffs were asked to collect about 450 commercial samples from all provinces and States and from different sources. Samples were taken at random and the number of samples for each province or State was fixed so as to correspond approximately to its importance in the gram trade. The samples were then sent to the Cerealist, Punjab Agricultural College, Lyallpur, for analysis.

The results of this analysis have been helpful in arriving at a tentative classification of commercial types of gram in India based on the colour of the grain. These are given in Appendix VII. It would appear that, broadly, gram may be classified into three colour sub-divisions, viz., brown, yellow and white. (Red, green and black gram are also met with in different parts of India, but only in small quantities.) The sub-division brown is by far the most important, but it comprises a good many shades, such as yellowish brown, light to dark brown, very dark brown or dusky and occasionally even bluish or reddish brown. Incidentally, a few facts may be mentioned about the *Gulabi* (pink-coloured) variety of the Central Provinces. Seeds of this type, when examined, revealed a close resemblance in shape to the small-sized *Kabuli* types, but the colour was found to be more akin to a shade of whitish brown than pink. The *Gulabi* has, however, better parching qualities. It is soft, sweetish and parches well, the qualities which are present in parched *Kabuli* types to a very much lesser degree. The results given in the Appendix mentioned above would indicate how grossly the different colours have been misinterpreted by the trade and the public in different parts of India.

The absence of uniformity in the descriptions has rendered it difficult to estimate accurately the production of individual types in the various tracts. The estimates given below should, therefore, be taken to be very approximate.

*Punjab.*—The varieties in this province can be classified as under :—

1. *Desi* :—(a) Yellow :—Various shades of yellow from light to golden.

(b) Brown :—From light and dark brown to very dark brown or dusky.

2. *Kabuli* :—Also known as white gram. The seed coat is of a paler colour than the yellow variety. The seeds are generally large, but there is also a distinct small-seeded variety.

\* "Studies in Indian Pulses—(2) Some varieties of Indian Gram (*Cicer arietinum*)", by Dr. F. J. F. Shaw and Khan Sahib Abdur Rahman Khan—Mem. Dept. of Agri. India, Bot. Ser. Vol. XIX, No. 2, May 1931.

No figures are available regarding the relative distribution of these varieties. The dark-coloured varieties are more common in the North-West Punjab, while the yellow is grown mainly in Ferozepore, though met with throughout the province. The area under the *Kabuli* types is very small. Gram of green colour is also grown in certain parts of the province in negligible quantities.

*Patiala State*.—The local varieties are the same as in the adjoining British province of the Punjab, but the yellow variety occupies a relatively smaller area than other types. In the market, the produce of this tract is available as a mixture mainly of dark brown and, to some extent, of yellow grains, and the quality is known as *Dara* (literally, fair average quality).

*North-West Frontier Province*.—The varieties are the same as in the Punjab but there is a proportionally larger area under *Kabuli* gram.

*Sind*.—There are three varieties, viz., (i) white or *Acha chena*, (ii) *Garha* or *Peela chena* (appears to be a shade of yellow or yellowish brown) and (iii) dirty-brown coloured or *Sanyasi*. The white variety is most important and is grown all over the province. The yellowish brown variety occupies about 40 to 50 per cent. of the gram area in the Upper Sind Frontier and Sukkur Districts. The *Sanyasi* variety is comparatively rare and occupies only 10 per cent. of the area in the Upper Sind Frontier District. The white variety is usually grown pure, but sometimes there is a little admixture with other types, the proportion being from 5 to 10 per cent. of the mixture, and sometimes even 20 per cent.

*United Provinces*.—As in the Punjab, there are three types, yellow, brown of various shades, and dusky. The lighter shades are more common in the Bundelkhand and Agra Divisions and the darker in the rest of the province. The river Ganges may roughly be taken as the line of demarcation between the two kinds. The Bundelkhand gram is also bigger in size than that of the Central and Eastern United Provinces.

*Bihar*.—The main varieties in this province are (i) *Bara dana* (large-grained) and (ii) *Chhota dana* (small-grained). The bigger variety is, as a rule, brownish but occasionally it is yellowish as well. The *Chhota dana* is usually the product of low lands and has a dark brown hue.

*Central Provinces*.—There are two important varieties, viz., (i) *Desi*, which is usually brown (*Imalia*) but occasionally yellowish brown (*Haldia*) and (ii) pink (*Gulabi*).

More than five-sixths of the area in the province is under *Desi* gram. The seeds of the common types taper to a point and the seed coat is either smooth or rough, whence further sub-grades arise.

The *Gulabi* gram is really an improved variety (D-8) introduced by the local Agricultural Department some 15 years ago, but has established itself as a commercial crop since. The seed of this variety is generally round, though a few tapering ones have also been noticed. The *Gulabi* gram is grown chiefly in the northern districts of the Central Provinces. It is specially in demand for parching purposes and sells on this account at a higher price than the *Desi* gram.

Other varieties like "green" gram, *Parbatia* (from Parbatipuram in Ganjam) gram and "black" gram are also met with in this province in small quantities. Formerly the *Parbatia* gram was used mainly for parching, but the *Gulabi* variety is now preferred for this purpose. The bigger *Kabuli* variety is also seen sometimes, but this is used mainly for table purposes.

*Bombay*.—Four varieties are common, viz., white, yellow, reddish brown and dark brown. In general cultivation, all these varieties are sown mixed, but one or the other of these may predominate. The produce of Gujarat and Deccan is known as "yellow" gram, as it is predominantly yellow-grained, though there is also a small proportion of reddish brown grains. In the Karnatak, reddish and dark brown grains are generally found in equal proportions but sometimes as much as 95 per cent. of the grains are dark, whence it is known as "black gram". It is reported that there is a special demand for this quality from Goa. The *Gulabi* gram is also grown to a small extent in this province, mainly in the Ahmednagar District.

*H. E. H. the Nizam's Dominions*.—White, yellow, dark brown and black are the chief varieties. The "dark brown" variety is the most common and covers about 90 per cent. of the total gram area in the State. The yellow variety is found in the Marathwadi tract and accounts for nearly 8 per cent. of the total area. The balance (2 per cent.) is mostly under "black" gram and is grown principally in the Raichur District. The white variety is of no commercial importance and is seen only in the Aurangabad District.

*Other areas*.—No data are available in respect of some of the important producing States. In areas such as Madras, Bengal, etc., where gram is a comparatively minor crop, all the different types cultivated are grouped together under a single class called *Desi*. Such produce is generally of an inferior quality compared with that of the more important producing tracts.

(b) *Improved varieties*.—In their study on gram made in 1915 (referred to at page 2 of this report) Messrs. Howard, Howard and Khan have described 25 distinct types of gram which they had isolated from seed samples collected from the districts of Aligarh, Muzaffarnagar and Saharanpur in the United Provinces and a small area of Bihar around Pusa. This study was continued and in a

paper published in 1931\*, Messrs. Shaw and Khan have described 59 further types isolated by them from samples collected from all over India in 1924.

Both the above studies classify gram on the basis of morphological characteristics, such as habit, size and colour of leaves, number, size and colour of flowers, size of pods and size, morphology and weight of the seeds. The individual types have also been numbered as Pusa 1 to Pusa 89. Sufficient data are not available about the relative performances of each type, but under conditions prevailing in Pusa, the types 17, 18 and 25 are said to be the best yielders, while Pusa 9, though having a lower outturn than the above, is stated to yield a crop of better quality. The normal yield of Pusa types 17 and 25 in Bihar is about 1,200 lb. per acre, but yields as high as 2,843 lb. are also stated to have been recorded.

The various Agricultural Departments in the main producing provinces have also evolved a number of disease-resistant and high-yielding types of gram. Though some of these, like the *Gulabi* of the Central Provinces, have large areas under them, the area under improved varieties in India as a whole is relatively small.

*Punjab.*—The more important strains evolved by the Agricultural Department are as follows:—

*Type No. 1.*—This is a *Kabuli* variety with bold and creamy coloured grains. It is mostly used in the kitchen. A single grain of this variety is equal in size to nearly 3 of the ordinary types.

*Type No. 7.*—This has an attractive greenish yellow colour and a vigorous growth. It is somewhat resistant to blight.

*Type No. 15.*—This is a yellow-gained variety.

*Type No. 17.*—This has dusky grains, with more grains per pod. It yields nearly as well as No. 7 but sells at a slightly lower price.

*Type No. F. 8.*—This is a variety having brown-coloured, large and comparatively hard grains. It is unaffected by gram blight but is exceedingly vulnerable to wilt. It is a good yielder.

The area under these improved varieties is not known. But it is reported that in 1934-35, over 10,000 maunds of improved seeds, mostly No. 7, and partly Nos. 15 and 17, were distributed by the Punjab Agricultural Department. From this, the area under improved varieties can be estimated at about 30,000 acres. The actual area may, however, be more, as there might also be some secondary distribution of improved seeds.

In 1940, No. F. 8 was distributed for the first time on a large scale to the cultivators of North Punjab. During the dry season which followed the sowing, the fungal disease 'wilt' developed and F. 8 succumbed to its attack. The Agricultural Department of this province has, therefore, concluded that F. 8 is an unsafe variety and cannot be recommended for cultivation in areas where wilt is a serious disease of the gram crop.

*Sind.*—"White Sukkur Red" (probably with a brown tinge), "Jacobabad" (local strains) and "Pusa 48" have been reported to have done well in this province. The area under them is, however not much.

*United Provinces.*—The local Agricultural Department has been attempting to spread the cultivation of Pusa types Nos. 17, 18 and 25 in this province, apparently without much success. In any case, such types are not known in the market as they usually get mixed up with other varieties.

*Bihar and Bengal.*—The improved type "S-4" (Sabour) as well as some Pusa strains have been tried in these provinces. The area under improved varieties is, however, very small.

*Central Provinces.*—A relatively large area (over 35,000 acres) is said to be under improved varieties in this province. This excludes the area under *Gulabi* gram, referred to earlier in this report. The following table gives a list of the strains that have proved successful under field conditions:—

Variety.	Outturn per acre (Average 1934-38).			Description.
	Northern Circle.	Southern Circle.	Eastern Circle.	
E. B. 28 . .	720	666	795	Early brown-seeded variety—high-yielding but susceptible to wilt.
E. B. 62 . .	687	487†	919†	Yellow variety, with medium maturity, high-yielding, partly susceptible to wilt.

\* Vide foot-note on page 9.

† Average for 3 years.

Variety.	Outturn per acre (Average 1934-38).			Description.
	Northern Circle.	Southern Circle.	Eastern Circle.	
E. B. 352 . . .	673	..	..	Brown-seeded variety—a selection from Burma. high-yielding and wilt-resistant.
Adhartal-Type 5 . .	733	714	..	Early brown-seeded variety with a high yield.
D-8 . . . . .	528	594	..	Gulabi (or pink) round seed variety, low-yielding but best suited for parching.

*Bombay.*—Dharwar strain No. 18-12 has been distributed on a small scale, round about Dharwar. The average yield of this strain (1935-36 to 1940-41) was about 666-lb. as against 514-lb. for local variety which was a mixture of "yellow" and "black" gram.

#### (6) RETENTION IN VILLAGES AND MARKETABLE SURPLUS.

Appendix VIII gives the estimated retention and the marketable surplus of the gram crop for the whole of India and in important provinces and states. This is also illustrated in the diagram facing this page. It will be observed that about 55·7 per cent. of the total crop is retained by the producer for his own requirements, the balance of 44·3 per cent. or 1,923,400 tons being marketable surplus. The marketable surplus of the gram crop is slightly lower than that of wheat (45·0 per cent.) and is higher than that of rice (40·5 per cent.)

It will also be seen that the proportion of the crop retained in villages is higher in the main producing belt of the Northern India. In the United Provinces, the Punjab, Bihar, and the Central Provinces for example, the percentage of the crop retained is approximately 69·5, 53·2, 80·0, 50·0 and 78·0 per cent. of their respective production, while in the North-West Frontier Province, Sind and H. E. H. the Nizam's Dominions it varies between 14 and 20 per cent. The comparatively high percentage of the crop retained by the cultivator in the United Provinces, the Punjab and Bihar is primarily due to the fact that in these areas gram is a very popular live-stock feed on the cultivator's own holdings.

#### (7) SEASONS OF HIGH AND LOW SUPPLIES.

The figures of monthly arrivals of gram in the assembling markets of most of the Indian provinces and States are not available. The information collected during the survey, however, shows that like wheat, most of the marketable surplus of the gram crop is disposed of in the assembling markets during the two or three months following the harvest. It is estimated that in most of the North Indian Markets, roughly 75 per cent. of the produce is sold in these months, the remaining 25 per cent. being distributed over the rest of the year. As will be seen from Appendix IX, in the Punjab (average of two markets) about 75 per cent. of the total marketable surplus arrives in the assembling markets in May-July, while in the Central Provinces (average of three markets) nearly 70 per cent. is marketed during March-May. It would also be observed that while in the Central Provinces, the heaviest arrivals take place in March, in the Punjab, where the crop is harvested later, the peak is attained in May.

### D.—Imports.

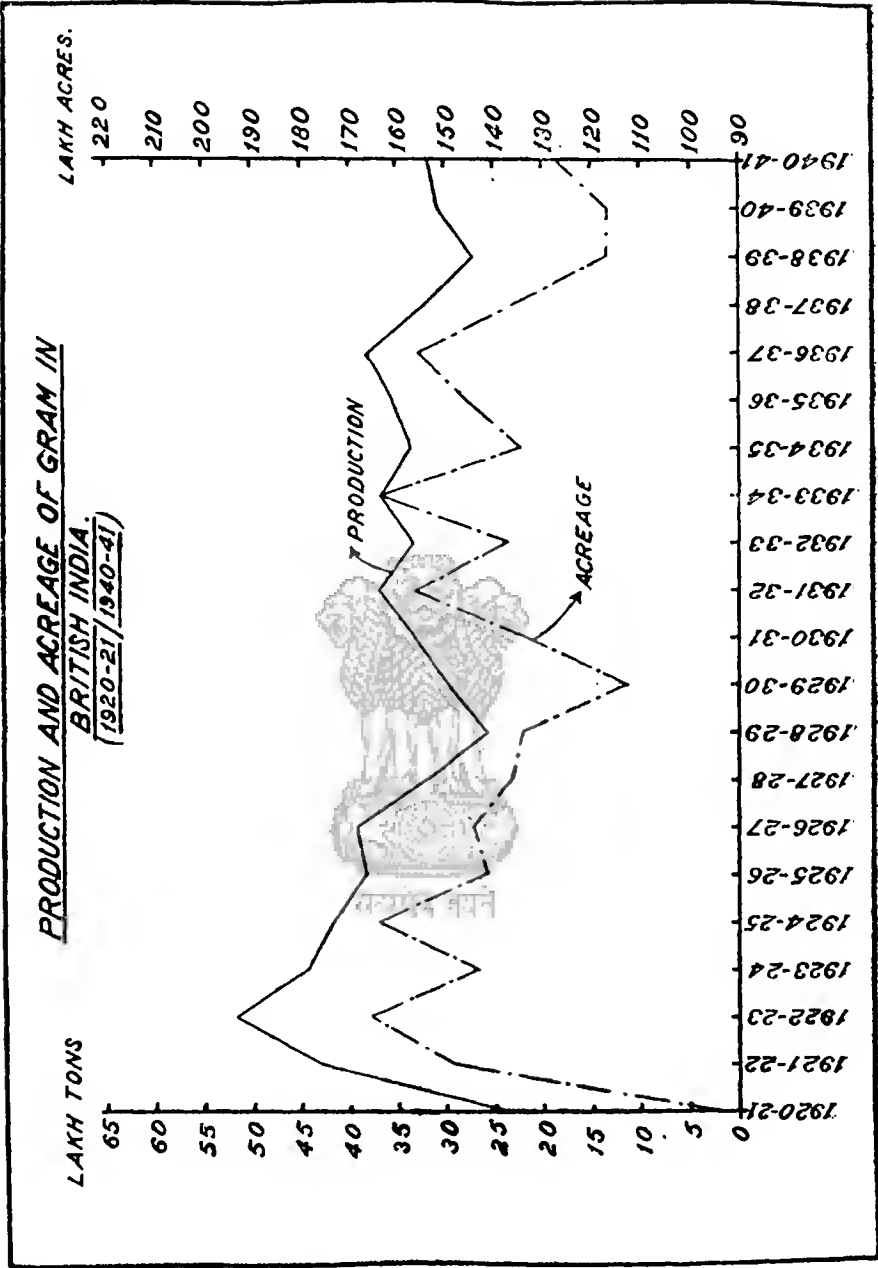
#### (1) QUANTITATIVE.

Appendix X shows the imports of gram into India by sea from 1920-21 onwards with sources and shares of importing maritime provinces. It will be observed that up to 1926-27, small quantities varying from 1,050 to 8,051 tons were imported in different years. Subsequently, however, there was a considerable increase in the imports and the total annual in-take during the period 1927-28/1940-41 ranged between 5,000 and 28,000 tons. During the quinquennium ending 1939-40, the annual imports averaged a little over 17,000 tons.

Burma is the chief source of the imports accounting for more than 99 per cent. of the total, the remaining 1 per cent. being shared by Iraq, Ceylon and others.

#### (2) SHARE OF PROVINCES.

It will be seen from the appendix mentioned above that the province of Madras is the largest importer of gram, followed by Bengal. The shares of these two provinces for the quinquennium ending 1939-40 were 71·8 and 25·5 per cent. respectively, Bombay, Orissa and Sind importing only small quantities. Large imports of gram into Madras and Bengal are mainly due to their being deficit gram areas, as also to their being easily accessible by sea from Burma.



## (5) IMPORTS AND EXPORTS.

The imports and exports of gram into and from India for the triennium ending 1939-40 averaged about 12,000 and 15,000 tons respectively. As has been stated in the previous chapter, the imports are mainly from Burma and the exports are to the United Kingdom, France, Ceylon, Straits Settlements and other neighbouring countries.

The quality of gram imported from Burma is inferior to that of Northern India varieties. In Madras, where the imports of Burma gram are large, the imported variety is mainly used for domestic purposes and is not considered suitable for parching, frying or *dal* making by the trade. It is small in size and dark brown in colour. On the other hand, almost all the important varieties of gram are exported to foreign countries. *Gulabi* and *Sind White* varieties are shipped from Bombay and Karachi respectively to ports in East Africa, Arabia and Iraq, presumably for parching. Yellow varieties of the Punjab are sent both from Karachi and Bombay to the neighbouring countries mainly for *dal* making, while the brown varieties are exported to Europe chiefly for stock feeding.

## CHAPTER III.—WHOLESALE PRICES.

## A.—Trend.

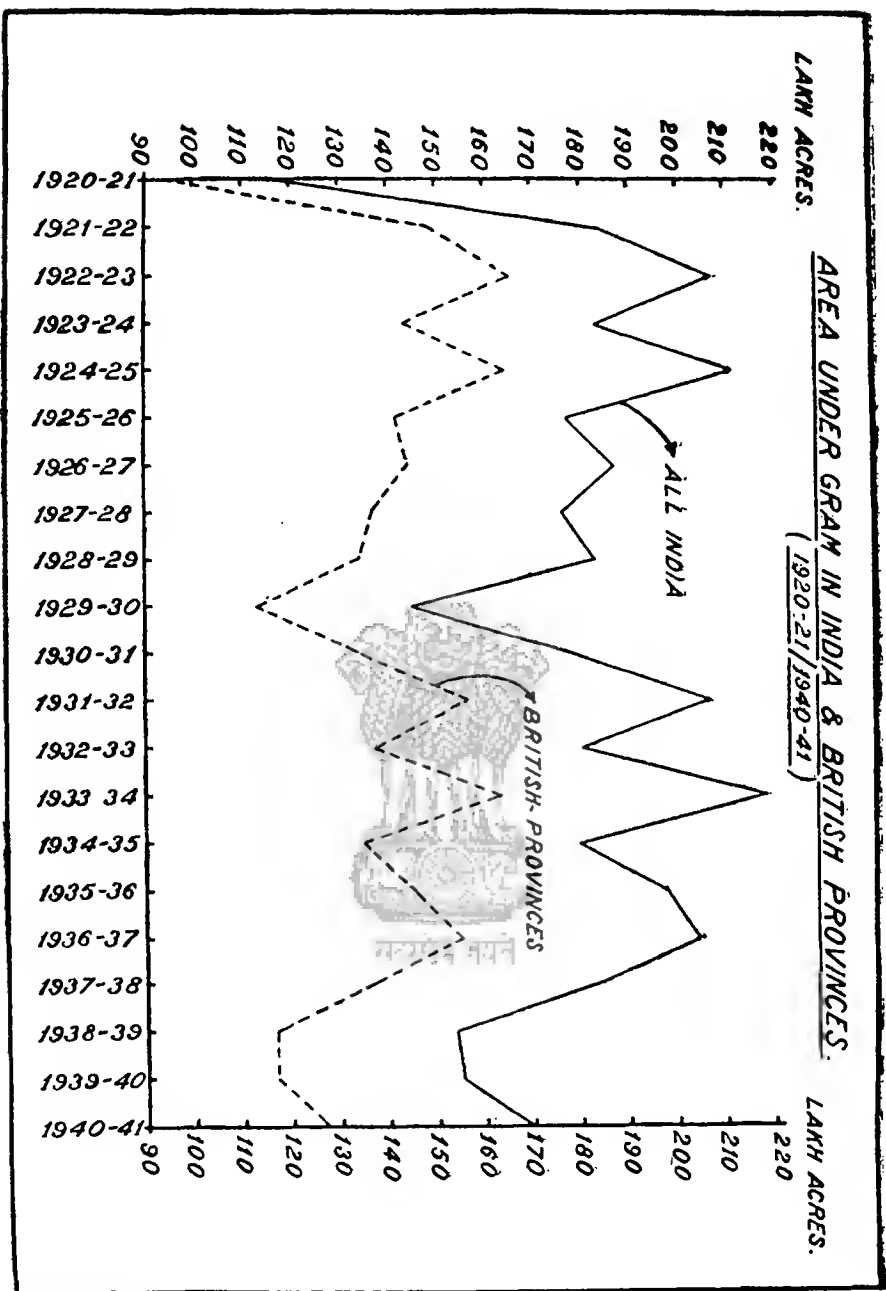
Appendix XV and diagram facing page 16, show the harvest prices of gram in the United Provinces, Punjab, Bihar and the Central Provinces, the main gram producing areas, from 1921-22 to 1940-41. It will be observed that the trend of prices in all these areas has been more or less similar during the past 20 years. The prices of gram as of other commodities were generally high during the post-war period until 1921-22. In 1922-23, there was an abrupt decline and prices continued at a low level during the following year as well. This decline was probably due to an abnormally good gram crop. The prices of wheat also were low during these years for the same reason. From 1924-25 to 1928-29, the prices had a gradually rising trend due mainly to short crops. In 1929-30 and the following years, however, gram prices were considerably depressed owing to the world wide slump. From 1938-39, they again show an upward trend. In 1940-41, prices fell probably as-a result of comparatively higher production in the main gram producing tracts.

## B.—Gram prices in relation to wheat prices.

Though on the whole richer than wheat from the point of view of food value [see Appendix XVI], gram is considered an inferior food grain in comparison with the latter cereal and should, therefore, be relatively cheap. A comparison of the prices of the two, however, reveals that in certain years gram has sold at par with or dearer than wheat. A brief review of the price ratios between the two commodities based on the harvest prices during the period 1921-22 to 1939-40 is given below.

Taking the Punjab first, it will be observed from Appendix XV and diagram facing this page that wheat prices remained invariably higher than those of gram during the seven years 1921-22 to 1927-28, the average difference being 22 per cent. In the following three years, however, gram prices were above wheat prices. In the year 1928-29 a poor gram crop in the province, as well as in India as a whole, was apparently responsible for a rise in the price of this food grain, while wheat remained unchanged at the previous year's level owing to the combined effects of a good local crop and comparatively low all-India outturn, with the result that the price of former grain stood 10 per cent. higher than that of the latter. In the following two years, although the prices of both the food grains declined owing to a general depression in the prices of agricultural commodities, gram sold 20 per cent. dearer than wheat due to a smaller increase in the production of gram as compared with wheat. During the next six year period 1931-32 to 1936-37, wheat prices, remained at a higher level, ranging from 9 to 18 per cent. above gram prices, but during the next three years, 1937-38 to 1939-40, there was again a reversal in the relationship; in 1937-38 due to a bumper wheat crop on the one hand and poor outturn of the gram crop on the other, the price of the latter ranged 15 per cent. above wheat; in 1938-39 the gram price was as much as 47 per cent. above the wheat price on account of a substantial advance in the price of the former grain resulting from an extraordinarily short crop and the wheat price increasing only to a lesser extent due to a small increase in production; in 1939-40 in spite of increased production of both wheat and gram, the price of gram remained unchanged at the previous year's level while that of wheat increased probably under the influence of the war with the result that the former was 21 per cent. dearer than the latter.

In the United Provinces also [see the diagram facing this page and Appendix XV] the price of wheat ranged above that of gram during the seven years 1920-21 to 1927-28 by 21 to 73 per cent. in different years, the average difference for the period being 46 per cent. which is a little more than double the corresponding figure in respect of the Punjab. In the two subsequent years the harvest prices of these food grains were at par. In the remaining years of the period under review, wheat was 6 to 44 per cent. (or 26 per cent. on an average) dearer than gram except in 1938-39 when both the commodities stood at par on account of gram price having risen due to a short crop.



In the Central Provinces (see Appendix XV and diagram facing this page) wheat price exceeded that of gram by 20 to 41 per cent. or an average of 30 per cent. during the seven years 1921-22 to 1927-28. In 1928-29 and 1929-30, the prices of wheat stood at only 6 per cent. and 5 per cent. respectively higher as compared with those of gram. In the following year due to a relatively heavier fall in the wheat price, the prices of both the food grains ruled at par. During the succeeding years 1931-32 to 1939-40, wheat price ranged 2 to 30 per cent. higher than that of gram, but in the year 1938-39 gram prices were higher than those of wheat by 2 per cent.

In Bihar, except for the year 1929-30 when wheat and gram prices were the same, in other years of the period under review the former was dearer than the latter by 13 to 52 per cent. in different years (see Appendix XV and the diagram facing this page).

It is thus clear that although gram is considered an inferior food grain compared with wheat, the former is not always cheaper than the latter. It appears that the prices of gram are affected primarily by its production and that the supply and prices of wheat do not have a predominant influence on gram prices. In other words, there seems to be no close complementary relationship between the supply and demand of wheat and gram, as is seen to exist, for example, between wheat and barley.

### C.—Official and trade prices.

Unlike wheat and other products, there appears to be little difference between the trade and official prices of gram. This is probably due to a comparatively narrow range of qualities in the case of this commodity. For instance in the Punjab, dark-brown and yellow varieties are mostly sold mixed as *dara* or fair average quality. Moreover, the difference in the prices of pure dark-brown and yellow grained qualities is only about three annas per maund.

The comparative official and trade prices at Agra for the years 1935 and 1936 are given in Appendix XVII. It will be observed that while in certain months there was no disparity between the two series of quotations, in others the difference varied from 2 to 16 pies per maund. The average difference during these two years was 3 pies per maund (0.8 per cent.) and 11 pies per maund (2.8 per cent.) respectively.

A comparison of the official and trade prices of gram at Amritsar for the years 1940 and 1941 also gives similar results. In this market, the difference between the official and trade prices ranged between 1 pie and Re. 0.2-4 or 0.2 and 4.8 per cent., the difference for the two years being 2 pies and 5 pies per maund or 0.3 and 0.8 per cent. respectively.

Similarly, in the Central Provinces for which prices of the year 1937 are compared, the average difference in the two sets of quotations is 7 pies per maund which works out to about 1.3 per cent.

It, therefore, follows that official prices of gram are more dependable than those of wheat in which case the official prices were found to vary as much as 21 per cent. in comparison with the actual trade prices.\*

### D.—Seasonal variations.

The seasonal variations in the average wholesale prices of gram (1935-39) in the more important markets in the chief producing tracts are briefly described below.

#### (1) UNITED PROVINCES.

The diagram facing page 19 shows the monthly deviation of prices from the average mean in the Hapur, Agra, Banda and Cawnpore markets. It will be seen that the prices have a downward trend from January, the lowest point being touched in March after which there is a more or less regular upward trend, although prices make a slight dip in June. The wheat crop is harvested a bit later and the pre-harvest decline, therefore, in that case starts in February. The total average deviation in wheat, however, is only about 12 per cent. This is because wheat prices are influenced not only by local conditions but also by those prevailing in other wheat producing countries of the world. The biggest post-harvest decline in the gram prices occurs in Banda when the prices are 12 per cent. below the normal mean. The total deviation varies from 19.8 per cent. at Agra to 27.6 per cent. at Banda representing a difference of Re. 7/9 to Re. 9/10 per maund, the average for the province being 23.2 per cent.

#### (2) PUNJAB.

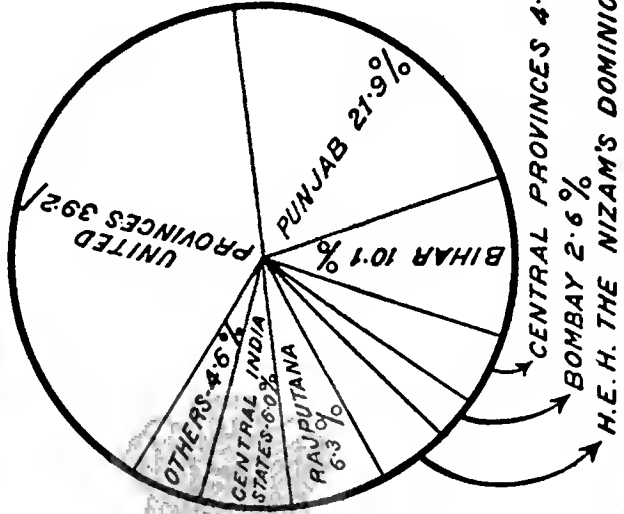
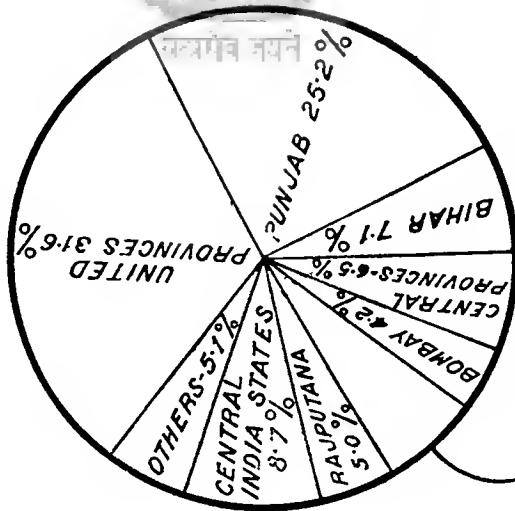
As in the United Provinces, decline in prices starts in January and the lowest point is touched in April. After a slight rise in May, prices again fall in June. Thenceforward, there is a regular upward tendency, the highest point being reached in December. The total seasonal variations at Lahore, Abohar and Amritsar average Re. 9/8, 10 annas and Re. 11/6 per maund between the highest and the lowest points of the year, i.e., 22.6, 28.2 and 27.2 per cent, of the mean respectively. The average difference between the post-harvest and off-season prices for the province as a whole works out to 25.5 per cent. (see diagram facing page 20) as compared with 23.2 per cent. in the case of both the United Provinces and the Central Provinces.



SHARE OF DIFFERENT TRADE BLOCKS IN ACREAGE & PRO-  
DUCTION OF GRAM IN INDIA  
(1936-37 TO 1938-39)

ACREAGE

PRODUCTION



## (3) BIHAR.

As in the case of wheat, the data received from Bihar does not appear to be reliable and sufficient. As will be seen from the diagram facing page 21 the pre-harvest fall at Bhagalpur, an important gram centre, starts in January, while at Patna the fall starts in the following month. Prices are lowest from March to June and then show an upward tendency, the peak being reached in December.

## (4) CENTRAL PROVINCES.

As referred to on page 3, the gram crop in this province is harvested from February and as the diagram facing page 21 indicates, prices are at their lowest in the month of February in all the markets and follow an upward trend till June when there is a short dip. The rise in the following months is almost continuous, the highest point being reached in December. It may be observed in this connection that in Nagpur, a consuming centre, prices follow the trend of those in Godarwara and Jubbulpore which are the supplying centres for this market except that prices decline slightly in April probably due to supplies from the United Provinces. For the province as a whole, the prices are highest in December and lowest in February except in Godarwara where the pre-harvest decline starts after November. The total seasonal deviation for the province on an average works out to 23.2 per cent. or Re. -/9/3 per maund.

## (5) PORTS : KARACHI, BOMBAY AND CALCUTTA.

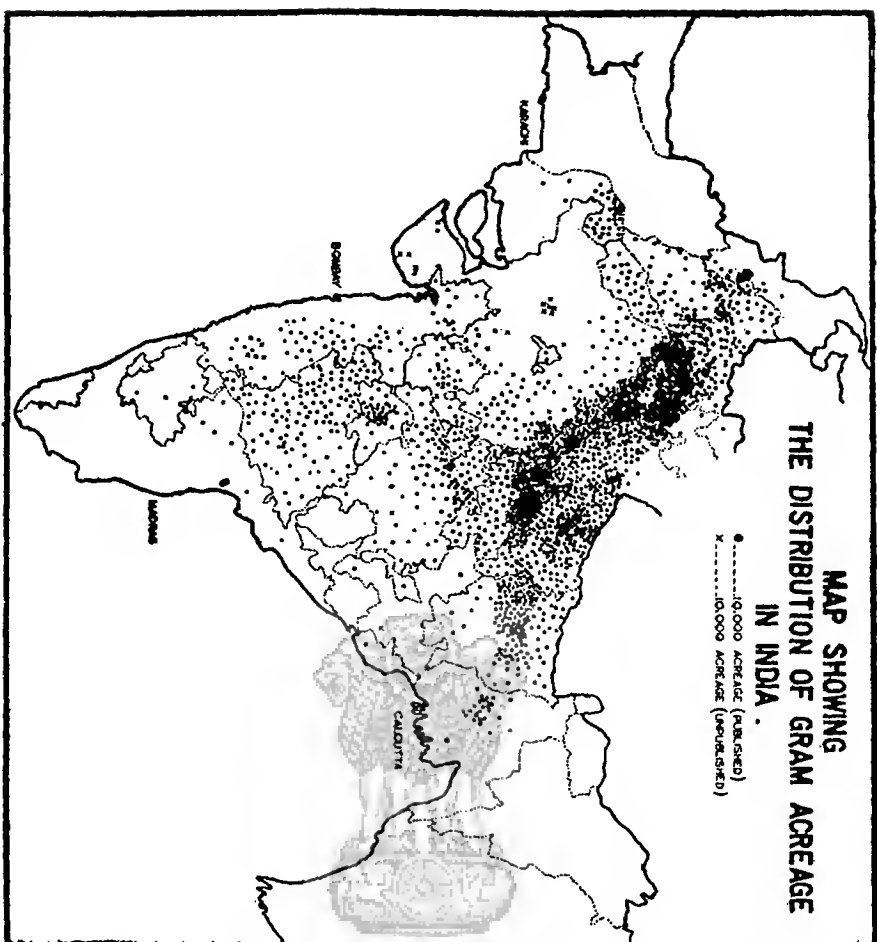
It will be seen from the diagram facing page 22 that the trend of prices at all these ports is more or less similar. As in the producing provinces, prices begin to fall from the pre-harvest months, January and February, except in Calcutta where they show a slightly upward tendency probably in sympathy with the prices at Patna. From July onwards prices show an upward trend reaching the peak in December.

To summarise, prices show a declining tendency in pre-harvest months (January-February), and are at their lowest during the post-harvest period (February-May). In the Central Provinces, the fall is rather sudden in February owing to the gram crop being harvested earlier in this province than in others. In all the provinces the prices show an upward trend after the post-harvest period with a slight decline in June, the highest point of the season being reached almost in all cases in December and the lowest between February to May.

## E.—Price differences in respect of quality.

Gram is generally sold in the market as a mixture of varieties grown locally, excepting in the Central Provinces where the various varieties based on colour differences are marketed separately. There is, therefore, no well-defined system of classification and trade descriptions of gram for the purpose of price quotations in most of the markets. For example, the quotations from the Orai market (United Provinces) refer to the fair average quality of that particular place. Similarly, in the Punjab, where mostly dark-brown and yellow grain varieties are met with, the produce is sold generally in the form of a mixture and as such there are no price differences due to quality. In a few instances, however, the dark-brown and yellow qualities are offered separately, in which case the difference in prices usually varies from two to four annas per maund in favour of the yellow quality. In Bihar, where size of the grain is the chief quality factor, the bold grained type fetches a higher price of about one to two annas per maund as compared with the small grained quality. For instance, on the 24th June 1940, at Monghyr *bara dana* (bold grain) gram was quoted at Rs. 3-5-6 per maund as compared with Rs. 3-4-0 per maund in case of *chhota dana*. In the Central Provinces, however, there is a marked difference in the prices of different qualities based on colour. *Peela* (yellow) sells dearer than *imalia* (tamarind colour) while *gulabi* fetches the highest price. The average monthly prices of these varieties at Godarwara for the years 1937 and 1938, are given in Appendix XVIII. It will be observed that the premium on *peela* over *imalia* varies between 2 and 6 annas per maund averaging to Re. 0-4-2 per maund while the premium on *gulabi* over *peela* varies from 7 annas to Rs. 1-14-0 per maund.

Since Bombay is a deficit province, large quantities of gram are imported therein from the Punjab, the United Provinces and the Central Provinces. Appendix XIX shows the prices of *peela*, Cawnpore (United Provinces) and Red varieties at Bombay from 1935 to 1939. *Peela* (literally yellow) is a superior type of gram. The Cawnpore variety which is derived mainly from the Central United Provinces consists of a mixture of yellow and black (dark brown grain). The so-called Red variety received from Karachi is the ordinary yellow gram of the Punjab with 2 to 4 per cent. admixture of black grain. As will be observed from the Appendix XIX the yellow variety (*Peela*) gets a premium varying from Re. 0-2-3 to Re. 0-5-1 over Cawnpore variety. The difference in the prices of the Red and Cawnpore varieties is, however, small and irregular. For the quinquennium ending 1939 the Red variety sold at an average of 7 pies per maund higher than the Cawnpore quality.



In Sind, the local white gets a premium over the yellow quality imported from the Punjab. The comparative prices of white and yellow varieties at Karachi for the period 1935-39 are shown in Appendix XX. The average premium for white variety varies from Re. 0-1-4 to Re. 0-3-10 per maund for the five years ending December 1939. The average price of white gram during this period works out to Rs. 3-1-11 as compared with Rs. 2-15-4 of the yellow variety.

Madras is the only province where Rangoon gram is imported in large quantities. Appendix XXI gives comparative prices of the Rangoon and the Punjab gram at Madras for a few months. It will be seen that the difference in the prices was generally higher during 1939 varying between Re. -7/2 and Re. -12/8 in favour of the Punjab variety. In 1941, however, the margin was comparatively small, probably due to decreased imports from Burma.

#### F.—Prices in different markets.

The average wholesale monthly prices of gram at two important producing centres and three port towns are given in Appendix XXII. It will be seen that the difference in price at the sources and at destinations is not constant. Normally, the price of a product at the producing centre should be closely related to its price in the consuming market, the difference consisting of transportation, handling and other incidental expenses and merchants' margin of profit. For example, large consignments of Punjab gram are exported from Abohar (Ferozepore district, Punjab) to Karachi. The normal difference, allowing for the expenses mentioned above, should come to 12 annas per maund. An analysis of the prices shows that although the disparity in the prices of gram at these markets varies between 8 and 15 annas, the average works out to 12 annas per maund, i.e., almost about the normal. This shows that, generally speaking, the prices at destinations on the whole conform to the prices ruling in the primary assembling markets. Similarly, the average difference between the actual prices of gram at Bombay and Cawnpore varies between Re. 0-7-2 and Rs. 1-1-5. The average difference comes to 12 annas per maund and the *proforma* difference between the two places works out to Re. 0-11-6 per maund.

#### G.—Comparison of "futures" prices.

Trading in gram "futures" is confined to only a few markets in the United Provinces and the Punjab and to the port of Karachi. In the main producing areas, the important "futures" markets are Hapur and Amritsar where the delivery months are described according to the *vikrami* era. For instance, at Hapur contracts are entered into for delivery in *Jeth* (May-June) and *Bhadon* (August-September) and at Amritsar *Har* (June-July) and *Asoj* (September-October). The difference in delivery months is due to the fact that gram is harvested later in the Punjab than in the United Provinces. In the Hapur market, contracts for delivery in *Jeth* (May-June) are open for 8 to 9 months from September-October to May and those for *Bhadon* (August-September) for four months from April to August, for *Manghsir* (November-December) for 4 to 6 months from July to December and for *Magh* (January-February) for 2 to 4 months from November to February. At Amritsar, however, *Har* (June-July) "futures" business starts as early as August and closes in June. At Karachi, July deliveries are contracted for during the period September-June. It will be noted from the above that, as in the case of wheat, May to July are the most important delivery months, i.e., the post-harvest period, when the supplies of gram are largest.

The wholesale "ready" and "futures" prices of gram at Hapur and Karachi are compared in Appendices XXIII and XXIV and in the diagrams facing pages 23 and 24. It will be observed that the "futures" prices in these markets show remarkable concordance of movement with the "ready" prices. As in the case of wheat, the "futures" prices seem to have a stabilising effect on the "ready" prices. It will be noted in this connection that when the spot prices are low, the "futures" quotations show a rising tendency, as for example, in 1935 and 1936. On the other hand, when the "ready" prices are comparatively high, the "futures" prices have a downward tendency as in 1937, 1938 and 1939. In the Hapur market, however, the "futures" prices were higher from January to June 1939 probably due to the extraordinarily short crop in the Punjab which gave an impetus to the "bullish" sentiment of the merchants in that market.

#### H.—Market intelligence.

Final forecasts of gram crop are published only in the Punjab, Bihar and Bengal, and in case of the Punjab the first forecast of the crop is also published in December. The area, estimates of production and wholesale harvest prices are, however, published in the Season and Crop Reports of the different provinces and States. These reports are of academic interest as they are issued long after the period to which they relate with the result that they are of no practical value to the trade. Important producing provinces such as the United Provinces and the Central Provinces do not even publish the final forecasts. It seems desirable that at least two forecasts, one after the sowing time and the other soon after harvesting may be issued at least for the United Provinces, Bihar and the Central Provinces, as gram is an important crop in these areas.

\*At present (1943) trading in futures is forbidden as a war measure.

†Report on the Marketing of Wheat in India, pages 105—6.

Monthly wholesale prices of gram in Calcutta, Bombay, Karachi, Lahore, Patna and Bangalore are given in the *Indian Trade Journal*. Wholesale and retail prices for important markets are published in the official gazettes for the various provinces and States. As these publications give the quotations long after the period to which they relate, they suffer from the same defect as is found in the information contained in the Season and Crop Reports. Daily prices, both "ready" and "futures" are published in a number of newspapers, both English and Vernacular, in port towns and important markets in producing areas. Besides, the merchants in all important markets keep themselves informed of the recent developments of prices in different markets by letters, telegrams and telephones, the latter being frequently used by merchants interested in the "futures" trade.

As far as the real tiller of the soil is concerned, he has to depend mostly on the information which he might get while visiting the market or from his fellow cultivator, village *baniya* or the itinerant dealer. In recent years, however, efforts have been made to disseminate the information among the rural areas by means of radio and gram prices are broadcast daily from the All India Radio Stations, Delhi and Lahore, for the Hapur and Amritsar markets respectively. The All India Radio Station, Lucknow, also broadcasts gram prices at Cawnpore thrice a week. It may, however, be noted that the number of radio sets in rural areas is not large and in order that the cultivator can take full advantage of the wireless, it is desirable that more radio sets should be installed in villages, particularly in the main producing areas.

#### CHAPTER IV.—FROM PRODUCER TO CONSUMER.

##### A.—Preparation for market.

Gram is prepared for the market almost in the same way as wheat, which is fully described on pages 119-122 of the Report on the Marketing of Wheat in India. Certain features peculiar to gram are, however, described briefly below.

##### (1) HARVESTING.

Unlike wheat, gram is usually reaped just before it is fully mature and when there is still a green tinge in the plant. If it is sown mixed with wheat and/or barley, it is harvested along with these crops. When harvested along with wheat, the gram in the mixture is somewhat overripe, which may result in some loss in yield through shedding. When harvested with barley, however, there is no such loss as both the crops ripen almost at the same time. Oilseeds, when grown with gram, ripen much earlier but as their stalks are taller, they are usually uprooted first, leaving the gram crop unaffected.

In the United Provinces, the Punjab, Bihar and Sind, gram is generally harvested by cutting the plant close to the ground with the help of a sickle. In Bombay, Bengal and Madras, the more common practice is to uproot it. In the Central Provinces both these practices are reported to be equally common.

In the Punjab, Bihar and parts of Bombay the cultivator usually harvests his crop with the assistance of his family but in the United Provinces and other provinces hired labour is commonly employed. Even in the latter case the poorer cultivators harvest their crop themselves aided only by members of their families.

Like wheat the harvesting of gram is done both on a contract basis and on daily wages. In the more important gram producing areas such as the United Provinces, the Punjab, Bihar, the Central Provinces and Bombay, wages are usually paid in kind, but elsewhere they are paid in cash. The bigger landlords and farm-owners, however, make cash payments even in the main producing tracts.

The approximate cost of harvesting one acre of gram in normal times on the daily wage and contract systems in important provinces is given below :—

Province.	Daily wages.				Contract in kind.	
	Number of persons employed.	Cash.	Kind.		Quantity.	Value.
			Quantity.	Value.		
		Rs. A. P.			(Per cent.)	
United Provinces	..	..	..	..	4 to 6.5	Re. 1/- to Rs. 1/4.
Punjab	4	..	48 seers gram. 48 seers chaff.	Rs. 2-8-0	..	..
Bihar	..	..	..	..	12.5	Rs. 2/1
Central Provinces	..	..	..	..	4 to 8 usually 5	8 as. to Re. 1/- Average 10 as. 11 as.
Bombay	..	..	..	..	5	..
Sind	4	1 12 0	..	..	..	..
Bengal	6	1 14 0	..	..	..	..
Madras	5	1 0 0	..	..	..	..
	(women).					

It will be seen that there is a wide divergence in the cost of harvesting from province to province. Even in the same province it differs from place to place, according to local factors, such as size of holdings, availability of labour, etc. The cost appears to be the highest in the Punjab but, as already mentioned, only the bigger landlords employ hired labour.

After the crop is harvested, it is bound up in large bundles by rope nets or cloth which are taken as head loads to the threshing ground if that is nearby. Otherwise, it is carried there loose on carts. As gram plants are small in size it is inconvenient to tie them into small bundles as is usually done with sheaves of wheat.

## (2) THRESHING AND WINNOWING.

There is only a slight difference in the methods of threshing gram and wheat. Harvested gram plants are kept on the threshing ground for a day or two to permit further drying. The leaves are then removed from the stalks by shaking them with a fork and gently beating them with a stick. Along with leaves small branches and pods are also broken up. This fraction is then winnowed, the chaff is thereby separated, and the heap which now consists of unbroken pods is trodden by cattle and winnowed again to separate the grain. Gram leaves, being delicate and brittle and slightly acidic in taste, are good dry fodder particularly for draft cattle but can seldom be used for the purpose if trodden over by bullocks.

The threshing of gram being a much easier process than that of wheat, the cost is naturally lower. Thus in the Punjab it costs normally only Rs. 2-8-0 to Rs. 3-0-0 per acre as compared with Rs. 4-8-0 in the case of wheat.

The winnowing of gram is similar to that of wheat. In the case of gram, however, the time taken is comparatively less as the grain is bigger in size and the proportion of chaff to grain is also less, viz., 1:1 against 1:5 to 2:1 in the case of wheat. One man can winnow by himself the produce of an acre of gram in the course of a single day, if the wind is favourable. On an average, however, 2 to 3 men are employed for each acre and in the Punjab the cost which is usually paid in kind at 1½ to 2 seers per maund of winnowed gram, comes to about a rupee only as compared with about two and a half rupees in the case of wheat.

## B.—Assembling.

### (1) GENERAL.

There are no markets exclusively for the sale of gram in India. It is marketed along with wheat and other agricultural commodities in the same markets and through the same assembling agents and merchants. The methods of assembling, the market practices, the system of finance, etc., are also the same as for wheat.

### (2) SHARES OF ASSEMBLING AGENCIES.

The agencies mainly responsible for assembling gram are growers, cultivators collecting the produce of other growers, landlords, village merchants, itinerant dealers and wholesale merchants. The relative importance of the various assembling agencies handling gram in different provinces and States is shown in Appendix XXV and is summarised in the following table:—

*Approximate share of the various agencies engaged in the disposal of the marketable surplus of the gram crop in different provinces and States.*

(Per cent.)

Province/State.	Growers.	Cultivators collecting the produce of others.	Landlords.	Village merchants.	Itinerant merchants.	Wholesalers.	Direct disposal in huts and villages.
United Provinces . . . .	40	..	..	60-0*	..	..	..
Punjab . . . . .	70	0-5	1-5	20-0	8	..	..
Bihār . . . . .	10	..	..	90-0	..	..	..
Central Provinces . . . .	40	1-0	3-0	16	16	4	20
Bombay . . . . .	56	3	14-5	17-5	..	8-6	0-4
Sind . . . . .	..	..	10-0	25-0	25	35	5
North-West Frontier Province.	42	..	42-0	4-0	..	11	1
H. E. H. the Nizam's Dominions.	35	..	..	55-0	..	..	10

\* Includes itinerant merchants and landlords whose share is negligible.

It will be observed that, growers themselves assemble large quantities of gram in the United Provinces, the Punjab, the Central Provinces, Bombay and the North-West Frontier Province and Central India States, the proportion of their share ranging between 40 to 70 per cent. of the total marketable surplus.

Village merchants are relatively more important in Bihar where their share in the assembling of the produce is estimated at 90 per cent. of the total. This agency is also important in H. E. H. the Nizam's Dominions and Rajputana where it is responsible for moving 55 and 40 per cent. respectively of the marketable surplus to the assembling centres. In other tracts, the share of village merchants in assembling gram varies from 4 to 25 per cent. In the United Provinces, it is not possible to distinguish between a village merchant, an itinerant dealer, a landlord or a cultivator collecting the produce of other growers. Their functions often overlap and all of them carry on as village merchants. The total share of these agencies has, therefore, been shown under village merchants and constitutes approximately 60 per cent. of the marketable surplus.

Wholesalers collect the produce from villages mainly in Bengal (40.0) and Sind (35.0) and to a small extent, in the Central India, North-West Frontier Province and Rajputana. Landlords assemble gram in the North-West Frontier Province, Bombay, Sind and Central India States but the quantities handled by them are not large.

Besides the quantities brought to assembling centres, a small proportion of the produce is also disposed of in villages and periodical markets for consumption in rural areas. This varies from 20 per cent. in the Central Provinces to 0.4 per cent. in Bombay.

In India as a whole, it is estimated that growers themselves assemble 42.7 per cent. of this produce; about 35.1 per cent. is handled by village merchants and 5.2 per cent. by itinerant dealers. The quantities handled by other agents are small.

### (3) MARKETS.

The different types of markets have been described in detail in the various Marketing Survey Reports issued by this Department and particularly in the Report on Markets and Fairs. The important assembling and consuming markets and the approximate quantities of gram handled annually in each are given in Appendix XXVI. It will be observed that Wanbacharan, Rohtak, Tohana, Dabwali, Uklana, Budhlada, Kaithal, Moga and Abohar are the more important producing markets in the Punjab, each handling between one and 4 lakh maunds of gram each year. In the United Provinces, Agra, Kosi, Banda, Maudha, Atarra and Kunch are the chief assembling centres, each handling about a lakh maunds of the produce every year. In the Central Provinces there is no market assembling more than 65,000 maunds of gram annually, but Jubbulpore, Gotegaon, Pipariya, Godarwara, Raipur, and Drug are relatively important. In Bihar, Patna, Dinapur, Shahabad, Gaya and Bhagalpur in the south and Darbhanga and Muzaffarpur in the north handle fairly large quantities. Jalgaon, Sholapur and Poona in the Bombay Province annually assemble above 1 lakh maunds of gram produced locally.

Among the consuming and distributing centres, besides the port towns of Karachi, Bombay, Calcutta and Madras, the important centres are Lahore, Amritsar, Rawalpindi, Multan and Sialkot in the Punjab, Meerut, Cawnpore, Lucknow and Bareilly in the United Provinces, Peshawar in the North-West Frontier Province, Mirkadam and Bhairab Bazar in Bengal and Tuticorin, Calicut and Trichinopoly in Madras.

No regulated markets have so far been established in the main gram producing belt in north-west India except in the Punjab. In the Central Provinces, Bombay and H. E. H. the Nizam's Dominions, gram is included in the commodities scheduled under their respective Marketing Acts and its sale is regulated along with that of other commodities according to the notified rules and the bye-laws of the local market committees. In these areas, however, there are very few regulated markets where gram is assembled in large quantities.

### (4) MARKET CHARGES.

The basis of market charges in the case of wheat and gram is usually the same. The total charges, however, increase or decrease depending on the relative prices of the two commodities and the nature of deductions in cash or in kind. As an illustration, the market charges payable on wheat and gram in the Hapur market are compared in Appendix XXVII and are summarized below :—

*Difference in the charges incurred in the marketing of gram and wheat at Hapur during 1938-39.*

(Per Rs. 100.)

Payable by.	1938.		1939.	
	Gram at Rs. 2.4.0 per maund.	Wheat at Rs. 2.8.0. per maund.	Gram at Rs. 3.0.0 per maund.	Wheat at Rs. 2.1.0 per maund.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
Seller . . . . .	3 0 11	2 14 8	2 11 3	2 12 9
Buyer . . . . .	1 11 9	1 9 9	1 6 11	1 8 3
Total . . . . .	4 12 8	4 8 5	4 2 2	4 5 0

It will be seen that when the price of gram is lower than that of wheat, the charges on the former work out to a higher figure as compared with wheat and quite opposite is the case when the price of gram is higher than that of wheat, as was the position in 1939. There would, however, be no such difference if the charges were payable on a percentage basis in cash or kind. Like wheat, market charges levied on gram in different markets differ widely as will be seen from statement given in Appendix XXVIII. As the various charges levied have been discussed in detail in the Report on the Marketing of Wheat in India, no further description is considered necessary here.

The reasons for regulating the market charges have been given in detail in the Report on the Marketing of Wheat in India. They apply equally to gram. Recommendations which apply more particularly to gram are, however, re-emphasised below :—

(i) As in the case of wheat, the total merchandising charges are exorbitant in several areas, e.g., at Cawnpore in the United Provinces and at Jubbulpore in the Central Provinces.

(ii) Gram being generally of lower value than wheat, the market charges payable on it should be proportionately less which is not usually the case.

(iii) In several markets a number of unspecified or miscellaneous charges are levied and are not generally subject to any scale or related to actual services rendered.

(iv) Where market charges are payable in kind, the seller has, in practice, to part with a substantially higher quantity of his produce than the declared customary rates, as grain is given by handfuls and not by actual weighment.

In order to enable the producer to get a fair return, it is essential that market charges be regulated and standardised. For the reason given in item (iv) of the previous paragraph, the system of payment of market charges in kind must also be improved as suggested above. Further, there is no justification for allowing unspecified charges as these are usually pocketed by commission agents without much justification.

### C.—Conservation.

#### (1) METHODS OF STORING GRAM.

The types of receptacles used for storing gram and the methods employed are similar to those for wheat. As these have already been described in detail in the Report on the Marketing of Wheat in India\*, it is unnecessary to repeat them here. In villages, the cultivator stores his produce in *kothis* (earthen bins) as in the United Provinces and Punjab, in *thekas* (hemp-cloth containers) as in the western United Provinces and eastern Punjab and in *dholis* (bamboo structures) as in the Central Provinces. In the latter area, a special type of receptacle known as "*lotna*" is also used for storing seed. This is made of paddy straw and generally with a capacity of 3 to 4 maunds, though larger ones holding about 15 maunds may also be met with. They are common in the Chhattisgarh area where the rainfall is heavy. There is a general belief in this province that grain stored in "*lotnas*" is immune from weevil attack.

In markets, gram is usually stored either in *kachcha khattis* (underground pits) as in the United Provinces or in *kothas* (godowns) as in other provinces. In *khattis* the gram is stored loose whereas in godowns the produce is kept both in bags and in bulk.

Most of the small processing establishments purchase gram for their immediate requirements and do not conserve large quantities. Larger concerns, however, obtain most of their requirements at the harvest time and stock the grain so that it may be processed in the off season. The storage is both in hulk and in bags, but bags are more common.

#### (2) COSTS OF STORAGE.

The cost of storing gram is practically the same as in the case of wheat†. A brief account of the cost in the more important producing areas is, however, given below.

In the Punjab, the rent of *kothas* for storing gram in bulk or in bags varies from place to place. For instance, the rent at Zira (Ferozepore District) is usually 8 annas per month for 100 bags but at Ferozepore it is as high as Rs. 2. In most other markets, however, the usual charge is between Re. 1 and Rs. 2 per month per 100 bags. The average charges in the province for storing gram including rent, lining, handling and depreciation on bags, may be taken as exactly the same as for wheat, i.e., about 1·8 pies per maund per month for a storage of about 6 months.

In the United Provinces, the average cost of storing wheat per maund in *kothas* and in *kachcha* and *pucca khattis* (cement concrete) is 2·4, 1·0 and 1·4 pies per month respectively. The cost of

\* Pages 203 to 207.

† Report on the Marketing of Wheat in India, pages 207 to 211.



storing gram in *kachcha khattis* of an average capacity of 600 maunds at Orai and Kunch, two important gram markets in Bundelkhand is, however, slightly more, as will be seen from the following table :—

Particulars.	Orai.		Kunch.	
	Rs.	A. P.	Rs.	A. P.
Rent . . . . .	12	0 0	15	0 0
Linings . . . . .	8	0 0	6	0 0
Handling :—				
Filling . . . . .	5	0 0	4	8 0
Emptying . . . . .	7	8 0	7	8 0
Cost for the season—Total (8 months) . . . . .	33	0 0	33	0 0
Cost per month . . . . .	4	2 0	4	2 0
Cost per maund per month . . . . .	1·3	pies	1·3	pies

Nevertheless, in this tract gram can be kept in the same *khatti* for one year without increase in the cost and for more than one year on payment of an additional rent only. Sometimes the storage period is extended from 2 to 4 years. In these cases the cost of storage is certainly lowered considerably but this may not be really economical in view of the damage which is caused to the gram.

*Pucca khattis* are rarely employed for storing gram as they are comparatively few and are, therefore, preferred for storing wheat.

### (3) LOSS IN STORAGE.

The loss in storage in the case of wheat and gram differs slightly. The chief factors responsible for loss are (a) *driage*, (b) dampness, (c) insects and (d) vermin attacks.

(a) *Driage*.—Loss through *driage* varies according to the moisture in the produce at the time of storage. It is estimated that on an average the weight of gram decreases by about 1·0 per cent. up to the outbreak of the monsoon. In the rainy season, there is an increase in the weight due to absorption of moisture from the air. This varies from province to province according to the climate. In the Punjab, for instance, the increase is generally between 1·0 and 3·0 per cent., in the United Provinces, 2·5 per cent. and in the Central Provinces about 5·0 per cent. With the cessation of rain this gain begins to disappear and by the time winter sets in, there may be a net loss. In the Punjab it is reported that loss during the first 6 months of storage is *nil* but during the next 6 months it amounts to about 2 per cent. In the United Provinces, the loss in *kachcha khattis* at Kunch increases at the rate of about 5·0 per cent. per year, being 5 per cent. in the first, 10 per cent. in the second and so on. In the Central Provinces stocks are generally disposed of within the first year. During the first 6 months, there is a gain of about 5 per cent. due to higher humidity during the monsoons. In the subsequent 6 months the loss through *driage* does not generally exceed this gain.

(b) *Damage by dampness*.—Gram cannot stand as much direct contact with moisture as wheat and suffers more loss in *kachcha khattis* than in *kothas*. Grain damaged by dampness is not fit for human consumption and therefore sells at a considerable discount. The main visible effect of dampness on quality is the fading of the colour and lustre of the grain. The damage is generally confined to that portion of the produce which is in direct contact with the floor and walls. Loss due to dampness is, therefore, higher in the case of bulk storage than in the case of storage in bags. It is estimated that in the case of storage in bags about 0·5 per cent. grain is damaged, while in bulk in *kothas* the damage varies from 1 to 3 per cent. according to the condition of the store. Damage in *khattis* is even more as will be clear from the following table :—

*Loss due to dampness in storage of gram in khattis in different markets of the United Provinces.*

Market.	Period of storage.	Quantity stored.	Percentage of damage.
		(Maunds.)	
Kunch . . . . .	4 months.	1,000	1·6
Hathras . . . . .	6 months.	520	4·3
Do. . . . .	16 months.	2,500	16·8
Do. . . . .	32 months.	1,000	24·8
Do. . . . .	40 months.	300	35·0
Do. . . . .	44 months.	200	39·8

It will be seen that the percentage of damage due to dampness increases with the period of storage.

(c) *Damage by insects*.—The more important insects that attack gram are the pulse beetles (*Bruchus Chinensis* and other species of *Bruchus*), the *khapra* beetle (*Tragoderma khapra*) and, to a less extent, *Calandra Oryzae* or the rice weevil. A small red-brown beetle (*Tribolium castaneum*) is also often found in company with these pests. This does not, however, attack the grain but usually follows the real pests and feeds on the dust produced by the latter. It is, however, a very serious pest of all ground cereals and pulses including *baisin*.

According to Fletcher and Ghosh\*, all pulse beetles do not attack gram in the same manner. Some work only in the store while others infest the seeds in the standing crop and are carried into the store where they multiply and cause further damage. In certain other cases, there is infestation in the field but there is no further breeding in the store.

The commonest pulse beetle is *Bruchus Chinensis*. Fresh generations of this pest occur in about three weeks' time and as the multiplication is several hundred fold the damage is enormous. The grubs gnaw into the seed and the adult beetle emerges through a hole by pushing open a round piece like a lid. This pest is found mainly in the store, though in some cases, green pods in the field may also be infested.

The *khapra* is generally most active from May to August or September. As its attack is confined usually to the top layers of the grain, depth in bulk storage is, to some extent, a protection. It is also known that the grubs of this insect live from season to season in the cracks and interspaces between the bricks in the godowns, feeding on dust and particles of grain present there.

The red-brown beetle (*Tribolium castaneum*) not only damages ground products like *baisin* but imparts a nauseous smell and taste to the stuff which lowers its value as food and hence its price. Its attack usually reaches a zenithal point in September-October.

The damage by insect attack is greater in the case of gram stored in bags than in bulked grain as more surface area is exposed in the former case. It can, however, be mitigated considerably if proper aeration, exposure to sun and winnowing are done during storage particularly from August to October. But as this involves labour and cost, this is rarely done. Like wheat, gram stored in pits is not very much subject to weevil attack.

There is nothing on record to show the extent of loss to stored gram due to insect attack. An idea can, however, be had from the tolerances allowed in their contracts for "futures" transactions by some of the trade associations in different provinces. In Kosi (United Provinces), the local trade association provides no tolerance for weevilled gram if the delivery month is Jeth (May-June) while 1.5 per cent. is allowed for delivery in Bhadon (August-September) and 2.5 per cent. in Manghsir (November-December) and Mah (December-January).

The Karachi Merchants' Association has adopted the following standards regarding weevil incidence in red gram :—

May	Nil : free ; excess to be taken $\frac{1}{4}$ into dirt up to 0.05 per cent. ; over 0.05 per cent. to be rejected.
June	Nil : free ; excess $\frac{1}{4}$ into dirt up to 0.10 per cent. ; over 0.10 per cent. to be rejected.
July	Nil : free ; excess $\frac{1}{4}$ into dirt up to 0.25 per cent. ; over 0.25 per cent. $\frac{1}{2}$ into dirt up to 0.50 per cent. ; over 0.50 per cent. to be rejected.
August	$\frac{1}{2}$ per cent. free ; excess $\frac{1}{4}$ into dirt up to 1 per cent. ; over 1 per cent. to be taken $\frac{1}{2}$ into dirt up to 2 per cent. ; over 2 per cent. to be rejected.
September	1 per cent. free ; excess $\frac{1}{4}$ into dirt up to 2 per cent. ; over 2 per cent. $\frac{1}{2}$ into dirt up to $2\frac{1}{2}$ per cent. ; over $2\frac{1}{2}$ per cent. to be rejected.
October	$1\frac{1}{2}$ per cent. free ; excess $\frac{1}{4}$ into dirt up to 3 per cent. ; over 3 per cent. to be rejected.
November	2 per cent. free ; excess $\frac{1}{4}$ into dirt up to 4 per cent. ; over 4 per cent. to be rejected.
December to April	2 per cent. free ; excess $\frac{1}{4}$ into dirt up to 4 per cent. ; over 4 per cent. $\frac{1}{2}$ into dirt up to 6 per cent. ; over 6 per cent. to be rejected.

\* *Stored Grains Pests* by T. Bainbrigge Fletcher and O. C. Ghosh—Bulletin No. 11 (1921) of the Imperial Agricultural Research Institute Pusa

It will be observed from the above examples that the allowance in respect of weevilled gram is between  $\frac{1}{2}$  and 2.5 per cent. and increases as the season advances. The maximum tolerance is reached towards the end of the rainy season and from November-December to April there is no change in tolerance. This shows that the incidence of weevil attack is highest during the monsoon months.

(d) *Vermin attack*.—As has been stated in the Report on the Marketing of Wheat in India (pages 217-18), rats are also responsible for considerable loss to stored gram. No estimates of such loss are, however, available.

#### (4) IMPROVEMENT OF STORAGE FACILITIES IN INDIA.

Among the indigenous methods of storage, storage in bulk in *pucca* over-ground godowns, preferably with sand spread at the top and/or mixed with it, has been found to be quite efficient in keeping down storage losses at a minimum. For instance, in the Hissar district of the Punjab, which is subject to famine conditions gram is stored in *kothas* for long periods, extending from 2 to 5 years, being kept in bulk mixed with sand in different proportions, usually about 50 per cent. by volume of the grain stored. In places where sand is not easily available, dry earth is substituted, though it is not as good as sand. Sometimes, gram layers are also alternated with layers of sand to secure the same end. By these methods, damage by dampness and insects is reduced to a minimum and there is practically no deterioration in colour and the general quality of the grain. If practicable, these may be given a trial in areas where loss by dampness and insects is relatively large.

Fletcher and Ghosh (referred to earlier in this Chapter) have made some very important recommendations regarding the storage of food grains in India. These are briefly summarised below and notwithstanding the lapse of time since they wrote their article (1921), their conclusions hold good even to-day.

Three results are aimed at in the successful storage of grain, *viz.*, (1) that it should remain undamaged by insects, (2) that it should not deteriorate in quality and (3) that it should not lose its germinating power.

Of the common containers in use in India, gunny bags are the worst as they expose the grains to insects all over their surface. The various earthen, mud and bamboo structures cannot be made insect-proof either. Also the anaerobic conditions produced by cutting off of air, may affect the quality of the grain considerably. Safety, therefore, lies in storing the grain in open-mouthed receptacles and at the same time preventing insects from gaining access to it. Solid masonry or concrete over-ground *Kothas* are, therefore, advocated and it is recommended that the top layers be protected by dry fine sand to a certain depth. To protect against the sand percolating down, and thus exposing the top layers, the contents of the receptacles should be shaken a little so that the sand put in goes down as much as possible. Sand should then be added again at the top to the desired depth. Sand has an additional advantage. Some of the pests (especially pulse beetles) infect the grains in the field and are carried into the store where they breed. The sand prevents this and the insects that come to the top for breeding purposes are unable to work their way down. They thus die out and are eliminated.

Primary infection in the field can be prevented by exposing the threshed grain as far as practicable to the hot sun in thin layers before storing it. Badly infected grain should not be introduced into a store, but should be dealt with separately. If the percentage of such grains is high, they may first be broken by beating, exposed to the sun and winnowed before storage, so that the insects are eliminated.

Storage, above ground is always preferable to storage underground such as in pits. Though there may be a little more initial expenditure in the first case, the better quality of the grain so stored fetches a higher price and the absence of loss due to insects, moisture and fermentation more than makes up for the initial expenditure.

#### (5) STOCKS AND CARRYOVERS AND SEASONAL VARIATIONS.

No reliable data of stocks and carryovers of gram are available in respect of the different provinces and States or even for any of the principal assembling markets, except for Hapur where a record of *khattis* stored with grain is maintained. This, however, does not include grain stored in *kothas*, as well as that in such *khattis* as are not registered with the local Chamber of Commerce. Generally speaking, stocks of *khattis* begin to rise from May and attain a zenithal position in September-October after which there is a gradual decline, the lowest stocks being in April. This is borne out by the following table and the diagram facing page 25.

*Monthly stocks of gram at Hapur.*  
(In *khattis* of about 715 maunds each.)

Months.	1936-37.	1937-38.	1938-39.	Average 1936-37 to 1938-39.	1939-40.	1940-41.
April . . . . .	Nil	42	13	18	240	6
May . . . . .	143	102	56	100	336	69
June . . . . .	160	99	77	112	324	113
July . . . . .	165	100	105	123	264	100
August . . . . .	171	100	114	128	210	104
September . . . . .	172	118	111	134	112	76
October . . . . .	175	117	107	133	97	72
November . . . . .	155	110	97	121	77	72
December . . . . .	124	82	93	100	59	47
January . . . . .	102	36	89	76	42	31
February . . . . .	61	23	75	53	17	19
March . . . . .	35	1	54	30	Nil	Nil

It will be seen that in 1939-40, the monthly stocks at Hapur behaved abnormally inasmuch as the highest stocks were recorded in May, after which they declined reaching a low level as early as in September. This was perhaps due to the failure of the gram crop in the Punjab during the previous two years and the resultant extraordinary demand on the produce of the United Provinces at harvest time. In 1940-41, the position of stocks was affected by war conditions and instead of rising from June onwards, as in other normal years, the stocks declined from that month.

Normally, stocks of gram begin to get depleted from October onwards and although there are some fresh arrivals from villages from October to December, the net stocks tend to decline owing to a relatively larger disposal.

The carryovers vary from province to province. In the Punjab, for reasons mentioned earlier, gram stocks are kept for longer periods. In the United Provinces, the average carryovers, mostly consisting of *khatti* gram, are estimated at about 10 per cent. The carryovers in Bihar are reported to be negligible, probably due to its damp climate. In the Central Provinces, it is estimated that carryovers do not exceed 4.0 per cent. of the total arrivals. In the deficit provinces and States, the local produce is consumed within a few months of its arrival and imports are thereafter made according to demand. There are, therefore, hardly any carryovers from year to year in such areas.

#### D. Handling and transportation.

In India, in any particular tract, the methods of handling are the same for all food grains. The descriptions that follow should, therefore, be read in conjunction with what has been stated on the subject in other marketing survey reports. Speaking generally, only special features relating to gram are described below.

##### (1) HANDLING.

(a) *On the farm and in the village.*—The handling of gram on the farm is similar to that of wheat.\* As with wheat, hired labour is seldom employed for moving the produce from the farm to the cultivator's residence, but even when it is resorted to, the cost is generally negligible. As in the case of wheat the system of employing the village weighman or *dharwai* for weighing produce sold off direct at the threshing floor, has also its counterpart in the disposal of gram grown in North India and the Central Provinces. In the latter province, the produce is, however, sold by the measure and while the measurement is commonly done by the buyer, the village *kotwal* is also sometimes employed. He is remunerated in cash or kind by the seller but generally in cash by the buyer.

In the Kurnool District of Madras, it is reported that the village merchant who purchases the crop from the producer, uses different measures for buying and subsequent selling, making 8 per cent. profit in that item alone. In addition, the producer is also asked to pay a charity fee of 1 pie per maund.

(b) *At markets.*—Handling at markets includes cleaning, weighing, filling and sewing of bags and transportation to rail or river heads. The process as well as the costs are discussed in a subsequent section of this report.

(c) *At river-heads.*—For transport over rivers, gram is usually put in bags. In the United Provinces, the loading or unloading charges at Ballia Ghat are 9 pies per bag of about 2 to 2½ maunds. The corresponding rates in Bihar, which is perhaps fairly representative of all riverine provinces, vary from 3 to 6 pies only.

(d) *At rail heads.*—The produce is always handled in bags at rail heads. The carts are unloaded into the railway godown by the consignor and coolies employed by him. The cost of the initial loading of wagons is generally borne by the railway as it is included in the freight rate. In certain cases, however, consignors may arrange loading at their own cost for the sake of expedition. Under the railway rules 10 per cent. of the bags should be weighed and the weight of the whole lot estimated from the test weight so obtained.

In most stations on the G. I. P. Railway, covered sheds are provided for incoming and outgoing consignments. It was understood that the supply of wagons was also fairly expeditious on this railway before the War broke out. Conditions on the N. W. Railway were, however, reported to be very unsatisfactory in this regard and often in many stations on this railway system, e.g., Larkana, Shahabad, etc., goods had to lie on the platform in the open awaiting despatch for days and weeks together, and exposed to the sun, rain and stray animals.

Once a consignment is booked, the handling at the intermediate stations and finally at the destination is the concern of the railways. Railway *hamals* or contractors are employed for this purpose. The former are paid at fixed monthly rates varying from Rs. 10 to Rs. 20 per mensem, while the latter are paid on the basis of per 1,000 maunds handled, which varies from railway to railway as well as from station to station on the same railway. Specimen rates are given in the Wheat Report.†

In most stations, *dalals* are also employed by the trade for clearing goods. Their duties are mainly (i) to effect the delivery of and to send goods in carts to the endorsed consignees and (ii) to book consignments and send the relevant railway receipts to the consignees. In the Central Provinces, such *dalals* are remunerated at 4 to 8 annas per 100 bags. In the case of petty consignments the charges are levied usually at the rate of 1 to 2 annas per parcel. Often the station *dalals* also control the labourers required for loading and unloading the carts and sometimes act as cart agents.

In Bihar, coolies charge one rupee to Rs. 1/8/- per 100 bags for loading and unloading the carts at rail heads. The corresponding rates in the Central Provinces vary from 12 annas to Rs. 1/9/-. The unloading charge at Madras railway station is one anna per bag. At Madura, handling from station to godown costs 9 pies per bag. At Tuticorin the corresponding rate is one to three pies.

(e) *At ports.*—Gram is usually handled in bags at the ports. At Karachi, the lorries taking the produce to the *bunder* charge Rs. 4 per 100 bags, of which 12 annas represent the cost of handling. The produce has then to be transhipped from the *bunder* to the boat and then again from the boat to the ship. The boat hire is Rs. 3 per 100 bags, including 12 annas for loading and unloading. In all, the handling charges come to Rs. 1/8/- per 100 bags. Wharfage is charged in addition. In the case of inward traffic, however, only wharfage and lorry charges have to be paid as the ship comes close to the *bunder*. The latest (1941) wharfage charges at the Karachi port for gram and its products are as follows :—

	(Per ton.)			
	Ship wharves.		Other bunders.	
	Rs.	A. P.	Rs.	A. P.
Gram . . . . .	1	3 0	0	9 6
Gram <i>dal</i> . . . . .	1	8 0	0	12 0
Gram flour . . . . .	1	8 0	0	12 0

In Madras, the handling charges from the port to the godown come to about 3 to 4 annas per bag of 196 to 220 lb. At Tuticorin, the corresponding rate is 4 annas per bag.

\* Page 229 of the Report on the Marketing of Wheat in India.  
† Report on the marketing of Wheat in India, page 231.

## (2) TRANSPORTATION.

As in the case of wheat and rice, for long distances, rail is the common mode of transport for gram, but for medium distances, say from 50 to 100 miles, the motor lorry has often proved a serious competitor to rail transport. Throughout India, bullock carts of varying capacities and drawn generally by a pair of bullocks constitute the premier means of road transport. In North India, Rajputana and Sind, camels come next in order of importance, while other pack animals such as bullocks and mules and *rehrus* (two small-wheeled cart drawn by a pony) occupy the third place. In Bihar and the Central Provinces the pack animal is usually a bullock, pony or buffalo. The potters in the Central Provinces also hire out donkeys for carrying loads.

The extent of grain traffic on inland waterways in India has already been discussed in other reports. The proportion in the case of gram is small, compared with rail and road-borne traffic.

(a) *Containers*.—Gram is generally moved from one market to another in bags. The cheaper ones are more popular and in internal trade second-hand ones are also used. The common types are the “B-Twill” and “Heavy C” bags. In Bombay, while second-hand gunnies are usually employed for bagging gram and gram *dal*, new ones are always preferred for *baisin*.

The size of the bag is to some extent regulated by the weight of the grain which it is expected to hold. The commonest weight is 2 maunds and 20 seers per bag, though in some cases the bags exported from the Punjab hardly contain more than 2 maunds and 16-17 seers of grain. Certain dealers in Kurukshetra in the Punjab, when questioned in this connection, said that the lowering down of the weight was based on an assumption that Punjab gram when exported to Madras through Karachi gained in weight by absorbing moisture so that it was expected to weigh to the stipulated extent on arrival at Madras ports. This does not, however, appear to be the real reason for this practice. As is natural, the Madras trade has lately been complaining about lack of uniformity in the weight of gram bags exported from the Punjab.

(b) *Transport by road*.—The transport of gram by road and the costs involved are not essentially different from those of wheat. Briefly, while bullock carts constitute the normal means of transport on roads, pack animals are preferred on *kachcha* or unmetalled roads, particularly during the rainy season. For short distances, gram is almost always transported by carts or on pack animals. For medium distances, the motor lorry may be used. The recent petrol restrictions brought about by the War have, however, affected lorry traffic considerably, but the large demand for wagons for essential war needs has also resulted in a heavy curtailment of the number available for normal civilian requirements.

(c) *Transport by rail*.—Gram and gram *dal* are included in the class of the Goods Tariff common to all grains and pulses, *viz.*, Class I (0.38 pie per maund per mile) and the different schedules adopted by the various railways are common to all grains and pulses. Gram flour is similarly placed in Class II (0.42 pie per maund per mile) along with *ata*, *suji* and *maida*. In addition, there are a number of station to station rates, applicable mainly to the traffic between upper India and many stations in Madras. The following table gives a few examples of such rates:—

From	To	Miles.	Station to station rate.	Pie per maund per mile.
			Rs. A. P.	
Bombay . . . . .	Madras	794	0 8 9	0.13
Via New Delhi* . . . . .	„	1,361	0 11 6	0.10
„ Raichur* . . . . .	„	351	0 8 0	0.27
„ Bezwada* . . . . .	„	268	0 6 1	0.27
„ Waltair* . . . . .	„	485	0 7 0	0.17
Agra Cantt. and via* . . . . .	„	1,239	0 11 4	0.11

There are various conditions attaching to these station to station rates, such as risk notes, minimum load, terminal taxes, etc. The bulk of the rail-borne traffic in gram is carried on these reduced rates.

(d) *Transport by internal waterways*.—As stated already, there is only a small traffic in gram over internal waterways and this is confined mainly to the United Provinces, Bihar, Bengal and Assam.

\*These are special rates which apply from other stations for these distances provided a gram consignment is booked to Madras, *via* any of the stations mentioned in the table. For example, if a gram consignment is booked from Rohtak to Madras, *via* New Delhi, the freight on it will be calculated by charging class rate for gram for the distance from Rohtak to *via* New Delhi and the special rate for the distance from *via* New Delhi to Madras.

## (3) DIRECTIONAL AND QUANTITATIVE MOVEMENTS OF GRAM.

(a) *Note on published statistics relating to internal movements of gram and gram products.*—Prior to 1937-38, the publication entitled "Accounts relating to the Inland (Rail and River-borne) Trade of India" used to include gram under the item "other sorts" of the major category "Grain, pulse and flour". Since that year gram is being exhibited separately, though in the trade recorded under certain blocks, the term "gram" has been interpreted in the more extensive sense of including all pulses, so that the published figures are slightly inflated. The error does not, however, appear to be widespread and as no other pulse has volume of trade anywhere approaching that of *Cicer arietinum*, the published figures could be taken as fairly representative.

The aforesaid publication also gives the movement statistics in relation to 22 distinct trade blocks in India. Under this scheme, the port towns of Calcutta, Karachi, Bombay and Madras and the other ports in Madras are treated as separate trade blocks as distinct from the provinces in which they are situated. In the figures relating to total quantitative movements, the mutual trade between these ports and the provinces concerned has, therefore, been cancelled for arriving at the net imports into and exports from the latter.

In regard to Indian States, in the majority of cases, it has not been possible to collect any information regarding individual exporting and importing tracts. It should, however, be noted that the published accounts relating to rail and river-borne trade, have been culled from data submitted initially by the various railway systems in India. The total trade in gram in most Indian States is, therefore, already included in these accounts, though sometimes in a consolidated form.

The position of statistics relating to gram as recorded in the "Accounts relating to the Coasting Trade and Navigation of British India" is also the same as in the case of "Rail and River-borne Trade". There are, however, no published statistics of gram entering the provinces and States through road routes, but where possible estimates are given.

In both the above publications gram products like *dal* and *baisin* are included in the general sub-class "other sorts". Some data have, therefore, been collected about the relative proportions of these from station records and shipping documents and supplemented by local enquiries. They provide, however, only a rough idea and should not be taken to approach arithmetical accuracy.

(b) *Directional movements—Exporting and importing centres and blocks.*—Generally speaking the chief producing areas, *vide* Chapter I, also constitute the chief exporting ones, but this is not true universally, e.g., in the United Provinces, the western half of the province including Bundelkhand produces more gram than the eastern portion, but owing to higher local consumption export is proportionately less. Individual importing and exporting centres do not also function with the same degree of importance at all times. Variations are caused by the development of more convenient communications in an adjacent or competing centre and also by differences in the production of the crop in the surrounding tracts from which assembling is made. Thus up to 1937-38, the markets in the Punjab were the pre-eminent exporters of gram to Madras but the place was taken up by certain centres in the United Provinces in succeeding years mainly due to deterioration of the Punjab crop since 1937-38.

A more precise study of quantitative movements between provinces and States is reserved for a later section. Quantities mentioned in this section should, therefore, be taken as more illustrative of the relative importance of individual centres or blocks, rather than connoting any absolute or even average values.

In the north and north-west of India, the Punjab, Punjab States, the North-West Frontier Province and Sind may be treated as one tract. These along with other important regions are discussed below.

*Punjab.*—There are two distinct exporting areas in this province, one in the north-west, comprising the districts of Mianwali and Shahpur and the second in the south-east comprising mainly the districts of Hissar, Rohtak, Ferozepore, Karnal, Gurgaon and Ludhiana. From the point of view of both production and exports, the latter is by far the most important. Its territory is also contiguous with that of the Indian States of Patiala, Faridkot, Nabha and Jind on the south-east, and of Bikaner in Rajputana towards the south, all of which are important producers and exporters of gram.

In internal trade, however, the north-western tract takes a more prominent part than the south-east, the principal districts catered for being Rawalpindi, Lyallpur, Sialkot and Gujrat, the first one taking a greater share than the rest. In the south-eastern tract, Ferozepore district occupies a pre-eminent position in this regard, Amritsar and Lahore being the chief importing districts.

In inter-provincial trade, the districts of Hissar, Rohtak, Ferozepore and Karnal by themselves account for nearly 75 per cent. of the exports of the province, the first three contributing heavier shares. The provinces of Madras and the United Provinces take more than two-thirds of these exports, while Delhi, Bombay and Mysore are other heavy importers. The whole of the north-western tract accounts for only about 15 to 20 per cent. of the total exports of the province the destinations being mainly in the North-West Frontier Province and Sind.

The Punjab is essentially not an importer of gram, but the proximity of important producing States like Patiala, Faridkot, etc., account for some imports amounting roughly to about 25 per cent. of the exports of the province. Lahore and Amritsar are themselves responsible for nearly 60 per cent. of these, while Jullundur, Gujranwala and Hoshiarpur, take up the balance. The United Provinces, Rajputana and Central India also export small quantities to the Punjab.

*Punjab States.*—The Bhatinda market in the Patiala State is the most important market in this group. The arrivals here are estimated at about  $4\frac{1}{2}$  lakh maunds on an average, of which only one-third is local, the balance being imports from the Punjab and the adjoining sister States. Imports in other parts of the Patiala State are estimated at another  $2\frac{1}{2}$  lakh maunds, the hilly district of Kandaghat accounting for half a lakh maunds. Kotkapura in the Faridkot State, Jaitu in Nabha and Jind in the State of that name are other important exporting markets in this group.

The exports of gram and its products booked from Bhatinda railway station are estimated to be about 16 lakh maunds per annum. The Patiala State also exports gram through other markets including some outside the State boundary. Such exports are estimated at about 6 to  $6\frac{1}{2}$  lakh maunds.

*North-West Frontier Province.*—Gram is exported only to a small extent from the North-West Frontier Province mainly from Kohat and Dera Ismail Khan to centres in the Punjab such as Rawalpindi and Multan which lie in contiguous territory. Peshawar city is the main centre of consumption within the province and draws its supplies principally from Laki Marwat and Naurang Serai in the Bannu district and various export markets in the Punjab like Mianwali, Alluwalli, Piplan, Kallukote, Moga, etc. The quantity imported into Peshawar generally averages about two lakh maunds, of which more than three-fourths is drawn from local sources. Havelian, Nowshera and Mardan are other important centres drawing considerable quantities from the Punjab markets.

*Sind.*—The port of Karachi plays an important part in the import and export trade of Sind. Foreign and coastal imports are usually very small, and the bulk of the arrivals into the province comes by rail. Till 1937-38, the Punjab used to contribute over two-thirds of these arrivals, the balance coming from Rajputana and the United Provinces. The exports from Karachi, on the other hand, are mainly by sea, though negligible quantities are also sent by rail and road to Baluchistan, and Bahawalpur and Jaisalmer States. In coastal trade, the Madras ports constitute the chief destinations, followed by Bombay.

In internal trade, about two-thirds of the marketable surplus of gram produced in the Upper Sind Frontier district has Karachi as its destination, a little over one-fourth is consumed locally, while about 10 per cent. is sent to Baluchistan. About 70 per cent. of the surplus of Sukkur district is sent to Karachi, 12 per cent. to Bahawalpur and Jaisalmer States and the balance is consumed locally. Larkana and Dadu districts send over 80 per cent. of their surplus to Karachi, the balance being consumed locally. Nawahshah district sends only a fourth of its surplus to Karachi, while Khairpur State sends the bulk of it to Sukkur.

*Rajputana and Central India.*—The Rajputana and Central India States are important producing and exporting tracts for gram. Morena and Bhind in the Gwalior State, Sriganaganagar in Bikaner, and Indore and Datia in Central India figure prominently in gram exports.

*United Provinces.*—In recent years, the United Provinces which are the biggest producers of gram in India have also taken the lead as the principal exporters. The chief producing regions in this Province have already been indicated in Chapter I. The local arrivals appear to be the highest in the markets of Bundelkhand, while Muttra and Agra takes the second place. On the other hand, the secondary \* markets in the United Provinces draw their supplies from wide areas including the outlying States in Rajputana and Central India, so that the volume of trade transacted is often out of proportion to the local production.

In the north-west and western United Provinces, Kosi, Muttra, Hathras, Orai, Kalpi and Banda, are the most important export markets. Agra and Aligarh are two other important markets in these regions. Next in importance are Cawnpore, Maudha, Phaphund, Ballia, Ghazipur, Gonda and Sitapur.

Within the province, the chief destinations for the exports are the major cities and towns, viz., Meerut, Dehra Dun, Moradabad, Cawnpore, Lucknow, Allahabad, Agra, Benares, Gorakhpur and Fyzabad. In addition, the whole of the north-western area, consisting of the Meerut and Rohilkhand divisions is a very important consuming area. Even the small towns and villages here import gram from the Muttra and Kosi markets within the province and also from the Punjab and Rajputana. Madras and Bombay are the principal outside importers of gram from the United Provinces while Bengal, Bihar, Delhi and Sind-Baluchistan blocks also import large quantities. They usually obtain their requirements from the nearest export markets in the United Provinces.

*Bihar.*—Bihar is the third largest producer of gram among British provinces and constitutes also the principal feeder province for the adjoining areas of Bengal and Assam, the chief exporting districts being Shahabad, Patna, Gaya, Monghyr and Bhagalpur. The Province also imports small quantities of gram and its products, mainly from the United Provinces. Besides, important industrial centres, like Ranchi, Jamshedpur, Chaihasa, Chakradarpur, Purulia and Dhanbad located in the Chotanagpur Division, import the grain and its products from the markets in the Central Provinces with which they have direct railway connection.



*Bengal and Assam.*—Bengal exports very little gram to other provinces. A small quantity of Patna gram imported from Bihar is, however, re-exported to the neighbouring province of Assam mostly by boats from Bhairab Bazar and Mirkadim. A small amount of the gram imported from the Central Provinces, Bihar and the United Provinces is also re-exported coastwise and by rail to the province of Madras and till recently by sea to countries in the Far East. The province is, however, a heavy importer of gram which is received mainly by rail from Bihar and the United Provinces and the Central Provinces.

In intra-provincial trade, Beldanga and Jiaganj in Murshidabad district and Bberamara, Alamdanga, Chuadanga, Kustbia and Meherpur in the Nadia District are the chief export markets located in producing areas. The destinations for these exports are mainly Calcutta and Howrah, but smaller quantities are also consigned to other places within the province. The exports from some of the above centres are over 50,000 maunds. Nimasarai, Baryahat, Rajshahi, Ishurdi, Serajganj, Mymensingh, Bhairab Bazar, Dacca and Mirkadim are other important gram markets in Bengal. They draw from and distribute mainly to local areas, but these are fairly large. For instance, Mirkadim draws its supplies of gram from many centres in the Malda, Rajshahi, Pabna and Faridpur districts and exports to equally wide destinations including parts of Assam. The total transactions at this centre are estimated to average about 25,000 maunds per year.

There is only a small export of gram from Assam and this originates mainly from Dhubri. Patna, Buxar and Bhagalpur in Bihar are the chief centres exporting gram to Assam. Minor centres in Bengal and the United Provinces also contribute small quantities.

*Central Provinces.*—Though only the fourth important producer among the British Provinces, the Central Provinces occupy the third place among the exporters. Its geographical position enables this province to distribute gram over a very extensive area, i.e., Bihar and Orissa in the North-East, Bombay to the west and Madras, H. E. H. the Nizam's Dominions and Mysore State to the south.

Jubbulpore, Nerbudda, Chattisgarh and Satpura are the chief exporting tracts. In internal trade, Nerbudda and Jubbulpore areas are the heaviest exporters, and about 50 per cent. of the marketable surplus of these tracts is consigned to areas within the province, Nagpur being the heaviest importer. The greater part of the remaining 50 per cent. goes to the Bombay Port and to places in the Khandesh, Deccan and Gujarat Divisions of Bombay, while a portion is also directed to Calcutta and places in Madras. The Satpura and Chhatisgarh blocks, on the other hand supply mainly the eastern half of the province and export largely to places in Madras and Orissa and to Calcutta.

Nagpur, Berar and Nimar are essentially importing areas. Nagpur gets its supplies from the Jubbulpore and Nerbudda blocks, and to a small extent from the United Provinces, while Berar and Nimar which used to get their supplies formerly from the Punjab now get them mostly from the Nerbudda and Jubbulpore areas as also from Central India and Rajputana.

*Bombay.*—Bombay is a heavy importer of gram which arrives mostly by rail, to a small extent by sea and in negligible quantities over roads on the land frontier. By rail, the chief sources are Cawnpore, Orai and Chirgaon in the United Provinces, Itarsi, Pipariya and Jubbulpore in the Central Provinces, Indore in Central India, Sriganganagar in Bikaner and Mandi Dabwali, Sirsa and Bhatinda on the Punjab side. Besides Bombay city itself the main importing centres in this province are Bijapur in the Southern Division and Amalner, Jalgaon, Sholapur and Poona in the Deccan. Bijapur and Amalner take only small amounts of gram, but Jalgaon, Poona and Sholapur take about 2, 1½ and 1 lakh maunds in a year. Imports into the first two centres are also generally irregular, the demand depending on local production. But Jalgaon, Sholapur and Poona manufacture *dal* and the demand for gram is, therefore, usually steady in these places. There are also some coastal imports of gram into the province, mainly from Karachi through the Bombay port. This quantity is, however, much smaller in comparison with rail-borne imports. The exports from the province consigned both coastwise and by rail are also equally small, the principal importers being Madras and H. E. H. the Nizam's Dominions and Mysore State.

*H. E. H. the Nizam's Dominions.*—In H. E. H. the Nizam's Dominions, the cities of Hyderabad and Secunderabad are the chief consuming centres, importing about 30,000 maunds of gram and gram *dal* per year. This is contributed both out of internal production and imports from the United and Central Provinces. Large quantities of gram and gram *dal* are also exported out of this State mainly from Osmanabad, Bid and Aurangabad into the adjoining territory of Bombay and Berar.

*Orissa.*—Local gram particularly the variety produced in the districts of Sambalpur, Cuttack, Ganjam and Koraput is of an inferior quality. The exports are very small, only limited quantities passing from Sambalpur to the adjoining feudatory States. Cuttack, Berhampur, Sambalpur, Bhadrak, Puri and Konda are import centres of some importance in this province, the gram coming mainly by rail from Bhatapara, Mundala and Raipur in the Central Provinces and in smaller quantities from Bihar, United Provinces and Calcutta. The grain and *dal* are also imported into the province by sea through Chandbali and Gopalpur, from where they are railed into the interior.

*Madras.*—The province of Madras is the premier importer of gram and gram products in India. The following table shows briefly the routes taken by the imported gram before it reaches the consuming centres in Madras.

## Routes of supply of gram in Madras.

Importing district.	By rail.	By road.	By sea.
1. Madura, Ramnad and Tinnevely.	From Tuticorin to all centres.	From Tuticorin internally.	Karachi and Rangoon up to Tuticorin.
2. Trichinopoly . . . .	From Madras or Tuticorin.	From Madras .	Karachi and Rangoon to Madras.
3. Tanjore . . . . .	From Negapatam or Madras.	....	Karachi and Rangoon by sea.
4. Malabar and Coimbatore .	From Calicut and Cochin.	....	Karachi to Cochin and Calicut.
5. Salem . . . . .	From Madras or Cuddalore.	From Cuddalore to interior.	Rangoon and Karachi up to Madras or Cuddalore.
6. South Arcot . . . . .	Cuddalore or Madras	Cuddalore	By sea up to Cuddalore from Rangoon and Karachi.
7. Vizagapatam, East and West Godavari.	Directly from North India, rarely from Vizagapatam port.	Within districts .	A small quantity to Vizagapatam and Cocanada from Karachi and Rangoon.
8. Guntur, Bellary, Anantapur and Kurnool.	Directly from centres in Northern India.	Do.	....
9. Cuddappah, Nellore . . .	From Madras port	Do.	By rail up to Madras from North India or by sea from Rangoon and Karachi.
10. North Arcot, Chingleput .	....	From Madras .	Do.

*Movements by rail.*—The Madras city alone imports 10 to 15 lakh maunds of gram by rail every year. The principal sources are the Punjab (Gidderbaha, Rohtak, Hansi, Kaithal, Garhiharsaru, Fazilka, etc.), the Punjab States (Mansa, Barnala, Sunam, Maur, Rampura-phul and Narwana in Patiala, Kotkapura in Faridkot, Jaitu in Nabha and Jind, Julana and Charkidadri in Jind), the United Provinces (Cawnpore, Atarra, Safdarganj, Ganjdandwara, Sitapur, etc., etc.) and in a smaller measure the Central Provinces (mainly Akaltura, Chhindwara and Raipur).

In the interior, the town of Bellary in the Ceded districts imports largely from the Gwalior State (Morena, Sabalgarh, Bhind, etc.) and in a smaller measure from the United Provinces. On an average such imports are estimated at over 60,000 maunds. Nandyal and Rajahmundry near the east coast of the province, are other heavy importers taking on an average about fifty and thirty thousand maunds respectively. The sources of import are the Punjab, Punjab States (principally Patiala and Faridkot) and the United Provinces. The Gwalior State is also the chief source of gram for the Anantapur district, while the Punjab is the main feeder for Ellore and Guntur in the east coast.

The above statement gives also the directions taken by gram exported by rail from Madras city and other Madras ports into the interior. The following table shows the approximate quantities so moved :—

From port.	Average quantity moved by rail into the interior.
	(In maunds.)
Madras . . . . .	2 lakhs 20 thousands to 2½ lakhs.
Tuticorin . . . . .	10 to 15 lakhs.
Cuddalore . . . . .	40 to 45 thousands.
Calicut . . . . .	90 thousands.
Cochin . . . . .	60 thousands.
Negapatam . . . . .	30 thousands.

The estimated imports of gram *dal* by sea from foreign sources (mainly Burma), have been given in Chapter I. Coastwise supplies of gram *dal* come only from Karachi. The following table sets forth the imports for the 3 years ending 1939-40.

*Imports of gram dal into Madras ports from Karachi.*

	(In maunds.)
1937-38	546,230
1938-39	320,080
1939-40	138,810

(ii) *Gram flour (Baisin)*.—*Punjab*.—Bahadurgarh in the Rohtak District is the principal exporter of gram flour in this province, contributing almost the entire exports of a little over 20,000 maunds. Madras and Bombay are the chief destinations. A little over 2,000 maunds is also imported into the province, mainly from Delhi and the adjoining districts of the United Provinces.

*Punjab States*.—In Patiala, *baisin* is manufactured mainly at Bhatinda from where it is exported to Madras, Bombay and Karachi. The exports are estimated at over 2 lakh maunds. There are no imports.

*Sind*.—About 75,000 maunds of *baisin* are imported into the province, mostly from Bhatinda and to a small extent from Sriganganagar (Bikaner). Karachi alone takes about 60,000 maunds. On the other hand, about 6½ lakh maunds are exported every year from Karachi to the same destinations to which *dal* is sent. The exports are far higher than the imports as Karachi has a number of mills for converting *dal* into flour.

*United Provinces and Bihar*.—Very little flour appears to move into or out of the United Provinces. All local demands are probably met by processing whole gram as and when required. The position appears to be the same in Bihar.

*Bengal and Assam*.—The import and export trade in gram flour is very small in these provinces. No reliable statistics are available but it is estimated that while a little over 25,000 maunds of flour are imported into Bengal, one-fourth of this quantity is re-exported from here to the neighbouring province of Assam.

*Central Provinces*.—Exports of gram flour from this province are estimated at not more than 500 maunds. They originate mainly at Raipur, Orissa being the importing province. For home consumption, flour is manufactured by hand *chakkis* or at local flour mills. Large quantities required by *halwais* are often imported, mainly from Ahmedabad, Godhra, Dohad, and Jalgaon in Bombay, Kalpi in the United Provinces and Bhatinda in the Patiala State. The total quantity imported is estimated at about 20,000 maunds and 40 per cent. of this is obtained from Ahmedabad alone as the quality is believed to be finer.

*Bombay*.—There is some export trade in flour from this province, originating mainly at Ahmedabad, Godhra, Dohad and Jalgaon but no reliable statistics are available. Imports are limited and are mainly from Ujjain and Bhatinda.

*Madras*.—Madras city receives its supplies of gram flour by rail mainly from Bhatinda in the Patiala State (over a lakh maunds) and Delhi (nearly 60,000 maunds). Stray supplies are also received from Ludhiana, Bahadurgarh and Sonapat in the Punjab and Agra in the United Provinces. Most districts to the north of the province do not import gram flour as such, but convert *dal* into flour when required.

The southern districts get their supplies mostly by sea from Karachi. On an average, the share of important ports may be estimated as follows:—

*Share of Madras ports in coastwise imports of baisin.*

	(In maunds.)
Tuticorin . . . . .	70,000
Negapatam . . . . .	20,000
Calicut . . . . .	15,000
Cochin . . . . .	15,000
Cuddalore . . . . .	10,000
	<hr/>
	130,000

(iii) *Crushed gram*.—In the Punjab, Rawalpindi is an important consuming centre for crushed gram. In addition to local supplies, it also imports about 25,000 maunds of crushed gram from the adjoining districts of the North-West Frontier Province. The total exports from the Punjab which originate mainly at Lahore (Badamibagh and Moghalpura Railway Stations), are estimated at about a lakh and a half maunds, the chief destinations being the United Provinces, Baluchistan, North-West Frontier Province, Bombay and Hyderabad State, in that order. Meerut, Jhansi and other military cantonments are the chief centres of consumption in the United Provinces. In the Central Provinces, Jabulpore town takes about 11 thousand maunds of crushed gram, out of the total provincial imports of about 20,000 maunds.

As with exports, a falling trend is also noticeable in the case of total imports (Appendix XXXIII) during the years 1937-38 to 1939-40, but there is an improvement in 1940-41. In deficit provinces with a considerable local production (e.g., Bombay and Bengal), it will also be observed that imports in individual years vary inversely to the local production of the previous year. This is, however, not always true (e.g., in Bengal in 1938-39 and Sind in 1939-40) which seems to suggest that demand for gram can be very elastic.

(ii) *Coastal trade.*—Appendix XXXIV gives figures of coastal exports and imports of gram from and into the principal maritime provinces in India. It will be observed that, on an average, the total movements are hardly one-ninth of the amount moved over rail and river. Karachi in Sind is the most important exporting port accounting for nearly 88 per cent. of the total coastal exports, followed by Bombay and the ports of Orissa. The ports, in the Madras Province are also important for such imports: they take up practically the whole of the shipment from Sind, and the bulk of those from other exporting centres.

Appendix XXXV and the diagram facing page 39 show the periodicity of exports of gram from Sind and imports into Madras by sea. Karachi gets the bulk of its supplies (mostly rail-borne) during the months of April-June and its coastal exports, therefore, tend to rise from July onwards up to October, and then they begin to fall, probably because of depleted stocks. These are partly replenished during the succeeding months of the year and exports from the port also rise. They tend to go down again from February onwards, due probably to the general absence of stocks, even in up-country markets. The importing ports of Madras Province show a similar tendency in regard to the seasons of high and low imports, though in individual months the behaviour sometimes differs.

The table below and the diagram facing page 40 illustrate the freight rates on gram and its products between Karachi and certain other Indian ports in recent years.

*Specimen coastal freight rates on gram between Karachi and other important Indian ports.*  
(Rupees per ton.)

From Karachi to	1937-38.	1938-39.	1939-40.	1940-41.	1941-42.	Since 1st July 1942.
Malabar ports . . . . .	7 6 0	7 6 0	7 6 0 <sup>‡</sup> 9 0 0 <sup>‡</sup>	10 0 0	10 0 0	24 8 0
Tuticorin . . . . .	7 12 0	7 12 0	7 12 0 <sup>‡</sup> 9 8 0 <sup>‡</sup>	10 8 0	10 8 0	26 0 0
South Madras ports . . . . .	8 8 0	8 8 0 <sup>‡</sup> 7 12 0 <sup>†</sup>	7 12 0 <sup>‡</sup> 9 8 0 <sup>‡</sup>	10 8 0	10 8 0	26 0 0
Madras . . . . .	5 12 0	5 12 0	5 12 0 <sup>‡</sup> 7 0 0 <sup>‡</sup>	8 0 0	8 0 0	19 8 0
Coromandel ports . . . . .	8 4 0	8 4 0	8 4 0 <sup>‡</sup> 10 8 0 <sup>‡</sup>	11 0 0	11 0 0	27 8 0
Calcutta . . . . .	9 4 0	9 4 0	9 4 0 <sup>‡</sup> 11 8 0 <sup>‡</sup>	12 8 0	12 8 0	30 8 0

It will be noted that the rates have gone up considerably since the commencement of the war. The rise is particularly steep since July 1942, probably because of Japan's entry into the war towards the end of 1941, and the consequential increased risks to coastal shipping.

(iii) *By road.*—Though there are no published data on the subject, the quantities of gram and its products moved over the road route are not estimated to be large. There is some movement of this type between the British territory of the Punjab and the Indian States close to it, but for purposes of internal trade, the Punjab including States has already been treated as constituting a single block. The United Provinces also imports substantial quantities of gram estimated at about 5 lakh maunds by road routes from the adjoining States of Rajputana and Central India. There are, however, very little exports by road from this province. The Central Provinces similarly take about 100,000 maunds of gram from Bhopal State but export only about 2,000 maunds by the road route.

(d) *Note on internal movements in gram products.*—The processing of gram will be discussed in a separate chapter. Though there are many by-products of gram in common use, only, *dal* and *baisin* are of some importance in inter-provincial trade. In the case of the Punjab and the United Provinces crushed gram also enters this trade in some degree, the demand coming mainly from military cantonments. Parched gram is almost always prepared locally and in any case it is never moved over long distances.

(i) *Gram dal—Punjab.*—The British province exports in a normal year over 6 lakh maunds of *dal*, mainly to Madras and Bombay. Hissar and Ferozepore are the main exporting districts contributing respectively about three-fourths and under one-fifth of these exports. A little over 20,000 maunds is also imported into this province mainly from Patiala and Faridkot States.

— April-September 1938.  
† October 1938—March 1939.

‡ April-September 1939.  
§ October 1939—March 1940.

*Punjab States.*—In the Patiala State *dal* is manufactured in Narwana, Narnaul, Barnala, Mansa, and Raman. The annual exports of *dal* (consigned mainly to Madras, Bombay and Karachi) are said to average nearly 3 lakh maunds. No statistics are available about the remaining Punjab States.

*North-West Frontier Province and Sind.*—The North-West Frontier Province has little trade of importance in gram products. The annual imports of gram *dal* into Sind are estimated at about a lakh maunds most of which comes from Amritsar by rail. Half of the quantity is taken by Karachi alone. The exports of gram *dal* from Karachi are far larger and are estimated at about 8 lakh maunds. Three-fourths of this quantity is despatched to ports within India, like Cutch and Kathiawar ports, Bombay, Cochin, Calicut, Mangalore, Tuticorin, Coconada, etc. and the balance to foreign possessions in India and abroad.

*United Provinces.*—Agra, Cawnpore, Muttra, Kalpi, Orai and Chit Baragaon are important *dal* producing centres. No reliable data are available, but total exports are estimated at over a lakh maunds. The Datia State lying close to the provinces is also an important producing centre for gram *dal*, and exports it to the United Provinces as well as other blocks. The imports into the United Provinces are estimated at under 50,000 maunds and are taken mainly by Saharanpur, Dehra Dun, Moradabad and Benares.

*Bihar and Bengal.*—Gram *dal* follows the same channels of import and export in these provinces as gram. No statistics are available regarding Bihar. Imports in to Bengal are estimated at about 2 lakh maunds, but exports appear to be far less, being a little over 25,000 maunds only.

*Central Provinces.*—Most of the *dal* produced locally is consumed within the province. Only Raipur in Chhatisgarh sends some quantities of gram *dal* to Orissa. The total exports for the whole province are not, however, estimated to exceed 10,000 maunds. Imports of *dal*, on the other hand, are over a lakh maunds, and over 95 per cent. of this quantity arrives from the Punjab and the United Provinces. Berar and Nimar receive over 95 per cent. of their imports from the Punjab alone, the balance coming from Jalgaon in Bombay and from the United Provinces. The Nagpur tract imports both from the Punjab and the United Provinces but rarely from Bombay.

*Bombay.*—In most of the big cities of this province, *dal* is manufactured by hand or power-driven *chakkis*. Only Jalgaon has a big mill with a capacity of about 50 bags of gram per day. Import and export figures of gram *dal* are not available.

*H. E. H. the Nizam's Dominions.*—In H. E. H. the Nizam's Dominions, the exports and import of *dal* more or less balance each other—each being equal to about 50,000 maunds.

*Madras.*—Exports of gram *dal* from Madras, as of gram, are inconsiderable. The estimated imports are given in the following table:—

*Imports of gram dal by rail into the Madras city and other centres.*

		(In maunds.)		
		1937-38.	1938-39.	1939-40.
(i) Into Madras city—				
From—				
Punjab . . . . .		93,120	50,160	13,510
United Provinces . . . . .		20,750	40,090	83,640
Patiala State . . . . .		104,590	158,860	65,810
Central Provinces . . . . .		1,370	23,930	78,430
Gwalior . . . . .		1,760	..	8,840
Other sources . . . . .		..	..	13,990
Total . . . . .		221,590	273,040	264,220
(ii) Into mofussil centres—				
From all sources . . . . .		399,100	400,890	400,060
GRAND TOTAL . . . . .		620,690	673,930	664,280

Prominent centres exporting to Madras city are Budhlada, Kaithal and Rohtak in the Punjab, Narwana, Mansa and Maur in the Patiala State and Cawnpore, Agra and a number of smaller centres in the United Provinces. Morena in the Gwalior State figures prominently in the supplies sent to Bellary, Nandyal, Guntur and Adoni. Budhlada in the Punjab also supplies practically to every district of Madras. In the United Provinces, Cawnpore, Agra and Orai are the chief exporters.

The above figures, it should be noted, include re-exports of both coastal and foreign (Burma) imports into the province, and in the case of Madras city, rail-borne imports as well.

*Coastal and foreign imports.*—The share of Madras ports in the foreign trade of India has already been indicated in Chapter I. In coastal trade which consists mainly of imports from Sind and to a less extent Bombay, the port of Tuticorin accounts for nearly half of the imports, followed by Calicut and Cochin.

(c) *Total quantitative movements of gram.*—(i) *By rail and river—Volume.*—Appendix XXIX gives the average annual rail and river-borne trade in gram between different trade blocks in India on the basis of the triennium ending 1939-40. It will be observed that in the whole of India, something like 3½ lakh tons of gram are moved from one trade block to another by rail and river, though the quantity actually moving by rail is far larger than this, as the figures given do not include the trade passing within the boundaries of a single block.

The approximate volume of trade passing between the various trade blocks is also illustrated in the map facing page 34. The directions taken by such trade are indicated by arrows which have been drawn in thickness, roughly corresponding to its volume or intensity. Coastal trade is also included in the map.

*Periodicity.*—Appendix XXX and the diagram facing this page give the average monthly exports (rail and river-borne) of gram from the important exporting provinces of the Punjab, the United Provinces, the Central Provinces and Bihar, which together account for some 75 per cent. of the total inter-provincial exports. It will be seen that on an average, exports reach their peak in April-May which generally coincides with the arrival of the new crop. From June to August there is a contraction mainly because of monsoon conditions which make transport difficult. In September, there is an improvement due to releases mainly from stored stocks and to some extent from secondary arrivals in the assembling markets. This movement continues fairly steadily up to December, but a contraction again takes place in January and February due, possibly, to exhaustion of stocks. There is a slight flare-up in March when stocks are cleared up rather quickly in anticipation of the new crop.

Individual provinces occasionally behave differently. Thus in the Central Provinces, the peak figure is reached in March as the new crop is harvested just then. In Bihar, water traffic improves during the months of June to August so that there is no contraction in the export trade, during this period.

For obvious reasons (as both export and import figures have been compiled from the same table in the "Accounts relating to the Inland Rail and River-borne Trade of India"), inter-provincial import trade in gram behaves almost in the same manner. This is evidenced by the figures furnished in Appendices XXX and XXXI and the diagrams facing this page and page 36. There is, however, an important point of difference. The depression noticed in the export trade in January-February, is not as steep in the case of imports. This happens because, in spite of the large supplies received in April-June, stocks in deficit provinces continue to remain inadequate during the winter months of October-March, due to heavy utilisation during this period. Import demand, therefore, shoots up. In January-February stocks in the assembling markets of the chief exporting provinces are, however, low. An effort is therefore made to make up this deficiency by importing from surplus tracts like the Central Provinces, Rajputana, Central India States, etc. The figures of exports from the Central Provinces given in Appendix XXXII will illustrate this point.

*Trend.*—As stated already, published data in respect of inter-provincial trade in gram are available only for the years 1937-38 to 1940-41. This is too small a period to permit the making of precise conclusions regarding trend; the observations made below should, therefore, be accepted with some reserve.

Appendices XXXII and XXXIII show the rail and river-borne exports of gram from and into the chief surplus and deficit provinces of India during this period. These are further illustrated in the diagrams facing pages 37 and 38. For the sake of comparison, the figures of production during the previous crop years are also shown side by side.

It will be observed that exports from the Punjab block have been falling off in recent years from a peak figure of nearly 180,000 tons in 1937-38 to 94,000 tons in 1938-39 and 50,000 tons in 1939-40. 1940-41 shows a slight improvement, but this is in no sense comparable to the figure reached in 1937-38. As already stated, the fall appears to have been primarily due to a deterioration in the gram crop of the Punjab since the year 1937-38.

In contrast, exports from the United Provinces have been showing an upward tendency during the same period. After recording a little rise in 1938-39, the exports from Bihar have remained at a low level. But for a slight drop in the year 1938-39, the production in this province has, however, remained fairly steady so that the lower exports could only be attributed to less demand from outside or higher local consumption. During the two years 1938-39 and 1939-40 the exports from the Central Provinces were comparatively high possibly because of the corresponding low exports from the Punjab.

(iv) *Chooni and gram husk*.—On an average, the Punjab exports a little under a lakh maunds of *chooni*, Bombay and Delhi being the chief destinations. About an equal quantity is also imported into this province, mainly from the Patiala State. This province exports also about 17,000 maunds of gram husk but imports are more considerable, i.e., nearly three-quarters of a lakh maunds most of which come from the Patiala State and a small quantity from Bikaner and Faridkot. Lahore and Ludhiana are the main importing centres.

#### (4) POSSIBILITIES OF IMPROVEMENT IN TRANSPORT AND HANDLING.

The Reports on the Marketing of Wheat and Rice in India have made certain important recommendations in regard to improved handling and transportation of these grains, which apply equally to gram. There is, however, one feature in rail-borne trade in this commodity which is somewhat peculiar. The export trade in the Punjab gram passing through Karachi to Madras ports has been falling off in recent years. Allowing for a portion of this fall as being due to a general lowering down of total movements between the two provinces, it still appears that by providing reduced station to station rates between exporting markets in North India and importing centres in Madras, railways have been able to capture much of the trade which used to proceed coastwise formerly. The diversion has apparently been further accentuated by the fact that the N. W. Railway, unlike certain other railway systems, does not give any concessional rates on gram exported to Karachi, so that the rail-borne portion of the traffic which used to pass through this port has become disproportionately costly. This indicates that the Railways grant station to station concessions mainly because of the fear of competition from alternative means of transport. The danger is that once this fear is removed, the special concessions may be withdrawn and it may then become too late to revive the alternative forms of transport. In the interest of gram trade in general, therefore, a substantial movement by the coastal routes should also be encouraged.

### E.—Distribution.

#### (1) AGENCIES.

As in the case of wheat, the agencies that take part in the wholesale distribution of gram are (i) cultivators, (ii) village merchants and itinerant dealers, (iii) wholesale merchants and commission agents, (iv) co-operative organisations, (v) trading associations and (vi) exporters.

The quantities of gram directly distributed by cultivators do not amount to much. In the Bombay and the Central Provinces, however, appreciable quantities of gram are sold in the weekly markets in the towns and villages by the producers or women members of their families.

The village merchant is sometimes an important distributing agent. In the Punjab, the United Provinces and parts of Bombay, village merchants purchase gram during the season and store it for resale later either to local consumers or at distant markets.

The bulk of the wholesale distribution of gram is in the hands of *pucca arhatiyas*. In the local distributive trade, the *pucca arhatiya* acts as the principal and arranges deals through *dalals*. In the export trade, he acts as a commission agent for local merchants or importers in other markets.

In the East Punjab, *pucca arhatiyas* have business connections as far away as Madras. In the United Provinces and Bihar, the *pucca arhatiya* acts as an exporter in surplus tracts and as an importer in deficit areas. His main source of income is the commission he charges, usually from the buyer alone. In the consuming zones of the Central Provinces, wholesale merchants are the chief distributors. They either purchase on their own account or act as commission agents, the former practice being more common. In these provinces, bags are generally lent out by the sellers in the local trade but charged at cost price when exported. In Bengal, the merchants either work on their own account or as commission agents on behalf of others. In the province of Madras, wholesalers get their supplies by sea as well as by rail from North India. They in their turn, supply gram to the larger retailers, the purchasers, fried gram sellers and *shandy* merchants. Some of the larger fried gram sellers also get their supplies direct from the exporting markets in North India by rail or from shippers at ports. In the North-West Frontier Province, the *mandi* owners function as *kachcha* and *pucca arhatiya* combined, attending both to assembling and distribution. They usually act as commission agents but if they know that prices at a distant market are rising, they purchase the produce outright for subsequent sale. In Sind, about 95 per cent. of the produce is distributed through wholesale merchants and commission agents, producers and village merchants playing an insignificant part.

Co-operative organizations play a very minor part in the distribution of gram. There are a few consumers' co-operative societies in India retailing gram but the amount distributed by them is exceedingly small.

## (2) TRADE ASSOCIATIONS DEALING IN "FUTURES".

The number of trade associations dealing in gram "futures" is small and these are located mainly in the Punjab, Patiala State, the United Provinces and Sind. Generally speaking, there is much less trade in gram "futures" than in wheat "futures". In the United Provinces, though many of the trade associations have a provision for forward trading in gram in their rules, few actually trade in "futures". Particulars of the more important trading associations and produce exchanges in India are given in Appendix XXXVIII. At present, however, trade in gram "futures" is prohibited by law as a war measure.

## (3) COST OF WHOLESALE DISTRIBUTION AND PRICE STRUCTURE.

As in the case of foodstuffs, the cost of distribution includes all the expenses from the point of delivery of a consignment by the seller till it reaches the consumer. As an illustration, the details of the various charges incurred by a merchant in Moga (Ferozepore district, Punjab) for selling gram in the Lahore market in pre-war days are given below :—

Consignment of 40 bags of gram weighing 100 maunds.		Rs.	A.	P.
1. Prime cost at Rs. 2-1-0 per maund		206	4	0
2. Charges at Moga—				
Dami at Rs. 1-8 per cent. less 5 annas per cent. rebate		2	7	0
Commission at 12 annas per cent.		1	8	3
Charity at 6 pies per cent.		0	1	0
Brokerage at Re. 0-1-3 per cent.		0	2	6
Filling, sewing and cartage to station at Rs. 3-8-0 per cent.		1	9	0
Station brokerage at 3 pies per bag		0	10	0
Terminal tax at 4 pies per maund		2	1	4
Depreciation on bags at 1 anna per bag		2	8	0
	Total	10	15	1
3. Railway freight at Re. 0-1-6 per maund		20	5	0
4. Charges at Lahore—				
Unloading and cartage at Re. 0-1-3 per bag		3	2	0
Terminal tax at 6 pies per maund		3	2	0
Commission at Rs. 1-9-0 per cent.		3	14	6
Brokerage, etc. at Rs. 1-5-0 per cent.		3	4	6
	Total	13	7	0
Prime cost		206	4	0
Charges at Moga		10	15	1
Railway freight		20	5	0
Charges at Lahore		13	7	0
	Total cost incurred	250	15	1
Wholesaler's margin		6	4	0
Retailer's purchase price at Rs. 2-9-2 per maund		257	3	1
Retailer's cost		7	4	8
Retailer's margin		14	9	6
Retail sale price at Rs. 2-12-8 per maund		279	1	3

Data of this type as applicable to certain other markets are given in Appendix XXXVI. The relative price structures are also illustrated in the diagram facing page 41. It may be observed that there is no basic difference in the levy of distributing charges between wheat\* and gram.

\* For details, please see pages 262-267 of the Report on the Marketing of Wheat in India.



## (4) RETAIL DISTRIBUTION.

The retailing of small amounts of gram directly by the producer and by co-operative societies has already been referred to. There are no special retail markets for gram. As has been mentioned in the Report on the Marketing of Wheat in India retailers in North India have a tendency to crowd together and form special bazars which are generally contiguous with the wholesale markets. Such shops deal not only in gram but also in a limited number of other grains. In contrast, retailers in isolated parts in a city and in villages deal in a variety of household requirements. In cities the retailer usually sells for cash. The village merchants on the other hand sell by barter or on credit as almost everybody in the village is known to them.

## (5) RETAIL PRICES AND PRICE MARGIN.

The costs of retail distribution consist (apart from the wholesale costs), of incidental charges in further handling at the retailer's shop, shortage in weighments, loss during storage, interest on capital for the length of time the produce remains in the retailer's shop and finally the latter's margin. The following table summarises the average pre-war differences between wholesale and retail prices in certain important markets in India. It will be noticed that as in the case of wheat\* retail margins, tend to widen as the distance from the surplus area increases. In the surplus areas such as the Punjab, the United Provinces, Central Provinces and North-West Frontier Province, the variation is only Re. -/1/3, Re. -/2/2, Re. -/1/9 and Re. -/2/9 per maund respectively, while in the deficit provinces of Assam, Bengal, Madras, Bombay and Sind, the average difference in the wholesale and retail prices of gram is between 3 annas and one rupee per maund.

Name of the province or State and the market studied.	Average variation between wholesale and retail prices of gram per maund.			Remarks.
	Rs.	A.	P.	
Punjab (Lahore, Multan and Amritsar)	0	1	3	Price margins in favour of retail prices were greater in Multan than in Lahore or Amritsar.
United Provinces (Bahraich)	0	2	2	
Central Provinces (Jubbulpore)	0	1	9	
North-West Frontier Province	0	2	9	
Bombay (Dadar)—				The margin may go up to 4 to 6 annas when small quantities are distributed.
Gram Jambusari	0	9	10	
Gram Sipra	0	14	8	
Gram Delhi	0	12	3	
Assam (Madhopur Hat)	1	0	0	
Sind	0	4	0	
	0	8	0	
Bengal	0	3	0	
	0	to	0	
	0	4	0	
Madras—				
(Triplicane Urban Co-operative Society.)	0	2	0	
	0	to	0	
	0	4	0	

## CHAPTER V.—GRADING AND STANDARDIZATION.

## (1) EXISTING SYSTEM OF CLASSIFICATION.

In India the different varieties of gram are evaluated on the basis of their colour, the proportion of impurities, i.e., refraction, and size of grains. With *dal* manufacturers, the ratio of husk to kernel is also important. In a previous chapter of this Report it was stated that the largest proportion of gram produced in this country is brown in colour, followed by yellow and white. In respect of value per unit, however, the order of importance is just the reverse, viz., white, yellow and brown.

(a) *Refraction*.—Impurities in gram consist of (i) dirt, stones and other foreign matter, (ii) other food grains such as barley and wheat, (iii) non-food grains, e.g., oilseeds, (iv) shrivelled or immature grains, (v) damaged and touched grains, and (vi) weevilled grains.

The presence of dirt, stones and foreign matter is, to a large extent, due to the threshing on *kachcha* floor, while the practice of sowing mixed crops and threshing of other crops on the same floor is responsible for the presence of barley, wheat, oilseeds, etc., in gram. Defective methods of preparation for the market account for the presence of immature and shrivelled grains and the subsequent inefficient storage promotes the attack by insects.

\* Report on the Marketing of Wheat in India, page 234.

The figures given in Appendix XXXVII based on the result of analysis of about 450 samples collected in the course of this survey show the proportion of impurities generally found in gram grown in different parts of this country. The diagram facing this page shows the results at a glance.

(i) *Dirt*.—It will be seen that the lowest average dirt content (0.17 per cent.) was found in the south-eastern districts of the Punjab, *viz.*, Hissar, Rohtak, Gurgaon, while in the north-western districts, *viz.*, Shahpur, Campbellpur and Mianwali, the average was 0.19 per cent. In the central districts of the Punjab, however, it was slightly higher (0.23 per cent.). In the western and eastern United Provinces, the average proportion of dirt was found to be 0.36 and 0.25 per cent. respectively but in Bundelkhand, an important producing tract, the dirt content was on the average 2.26 per cent. which is highest in the whole of India—the maximum in a sample from Bundelkhand being as high as 8.55 per cent. In the samples received from Bihar and the Central Provinces, the maximum dirt contents were 2.12 and 4.08 per cent. but the average came only to 0.92 and 1.37 per cent. respectively. In the samples received from H. E. H. the Nizam's Dominions, although the dirt contents have been found as high as 10.9 per cent., the average was only 2.12 per cent.

(ii) *Non-food grains*.—The average percentage of oilseeds and other non-food grains in gram varied from 0.19 per cent. in north-western Punjab to 4.9 per cent. in the Central Provinces. It exceeded one per cent. in the western and eastern United Provinces and Bihar. The highest contents of non-food grains, *viz.*, 33.62 were recorded in samples received from the Central Provinces followed by 20.91 and 25.64 per cent. respectively in those from eastern and western United Provinces. This is attributable to the practice of sowing gram and oilseeds as mixed crops.

(iii) *Other food grains*.—Small quantities of barley and or wheat are almost always found in gram throughout the country. In certain tracts, other grains, *e.g.*, peas (in Bundelkhand, United Provinces) and *teora* (*Lathyrus sativus*) in the Central Provinces are also present in appreciable quantities. The highest and lowest percentages of other food grains in gram averaged to 2.05 per cent. in the Central Provinces and 0.19 per cent. in H. E. H. the Nizam's Dominions, although the maximum, *viz.*, 16.45 per cent. was found in a sample from the eastern United Provinces. In Bundelkhand (United Provinces) and central Punjab, the corresponding averages were 1.78 and 1.5 per cent. respectively.

(iv) to (vi) *Shriveled or immature, damaged or touched and weevilled grains*.—These factors in relation to quality are the same in respect of gram as for wheat and have been fully discussed in the Report on the Marketing of Wheat in India (page 179). The average percentage of immature and shriveled grains was found highest in Sind (2.53 per cent.), followed by 1.80 and 1.74 per cent. respectively in the north-western and south-eastern Punjab. In the western United Provinces also the average proportion exceeded one per cent. In a sample from the south-eastern Punjab the percentage of immature and shriveled grain was as high as 7.43 per cent. This was perhaps due to the effect of strong hot winds which blew in these parts in March 1936—the year, from the produce of which the sample was drawn. The proportion of damaged and touched grains in the samples examined was highest in the case of Central Provinces (0.52 per cent.) and lowest in Bundelkhand (United Provinces—0.07 per cent.) and the maximum (3.11 per cent.) was found in a sample collected from the Central Provinces. The highest average proportion of weevilled grains, *viz.*, 13.27 per cent. was found in the samples received from Bundelkhand (United Provinces) followed by the Central Provinces (7.4 per cent.), H. E. H. the Nizam's Dominions (7.11 per cent.), Bihar (5.9 per cent.) and eastern United Provinces (5.26 per cent.).

*Summary*.—The total average proportions of various kinds of refractions found in gram in the main producing areas are shown in the diagram facing this page and are summarized below:—

Province/State.	Percentage.
<i>United Provinces—</i>	
Western . . . . .	7.16
Bundelkhand . . . . .	18.70
Eastern . . . . .	9.49
<i>Punjab—</i>	
North-western . . . . .	3.67
Central . . . . .	4.88
South-eastern . . . . .	4.90
Bihar . . . . .	10.04
Central Provinces . . . . .	16.99
Sind . . . . .	5.67
H. E. H. the Nizam's Dominions . . . . .	10.80

(b) *Natural test weight and size of grains*.—The natural test weight of any grain, *i.e.*, the weight in pounds per bushel, is an index of its plumpness and is, therefore, of considerable value in determining the grade of such grain. This standard is, however, not applied to gram or any other grain in this country. The natural test weight and weight per thousand kernels in grammes of samples collected during this survey have been determined. The results are summarized in Appendix XXXVII. It will be seen that the average natural test weight in this country varies from 58.5 lb. in Bundelkhand (United Provinces) to 62.27 lb. in the north-western Punjab, with a maximum of 64.7 lb. in the central and north-western Punjab and a minimum of 45.9 lb. in Bundelkhand, United Provinces. It may be noted that in all the three main gram producing tracts of the Punjab, the natural test weight is higher than in any other part of the country. In the Central Provinces and Sind also the natural test weight is high, the averages being 61.9 lb. and 61.28 lb. respectively, while in the main producing areas of the United Provinces, the averages work out to 60.82 lb. for the western United Provinces, 58.5 lb. for Bundelkhand and 60.22 lb. for the eastern United Provinces.

The size of grains can very accurately be judged from the weight per thousand kernels. The average weight per thousand kernels of gram for the samples received from the western United Provinces, Bundelkhand and eastern United Provinces was 125.64, 127.31 and 121.49 grammes, respectively. In the Punjab, the weight is highest in the south-eastern parts and lowest in the north-western—being 121.81 and 113.32 grammes, respectively. The highest weight recorded was 389.52 grammes in the case of a sample of white gram collected from Bihar. Similarly a sample of white gram from the Punjab weighed 300 grammes per thousand kernels. Generally the average weight per thousand kernels of white gram is higher than that of other types of gram, thus indicating that the grain of this variety is of bigger size.

(c) *Ratio of shell to kernel*.—The ratio of shell to kernel is of considerable importance from the point of view of the manufacture of *dal*, as it affects the outturn of the product. The analysis of samples has revealed that this ratio is 1 to 4.96 in the western United Provinces, 1 to 4.2 in Bundelkhand, and 1 to 4.6 in eastern United Provinces while in Bihar it is 1 to 4.27. In the south-eastern Punjab, the ratio is 1 to 4.52 which is a little higher than in the north-western and central Punjab, viz., 1 to 4.27 and 1 to 4.28 respectively. The average for the samples from Sind was the best (1 to 5.19) while the lowest, viz., 1 to 4.20 was found in samples from the Bundelkhand tract in the United Provinces.

## (2) METHODS OF SAMPLING AND ANALYSIS.

Methods of sampling gram and wheat are similar\*. The common practice is to draw a sample by thrusting a hand arm-deep into a heap and taking out a handful. In case of ragged gram, small quantities are taken out by inserting a *parkhi* into the bag. Visual inspection is considered sufficient and no actual analysis is performed.

## (3) SALES.

(a) *Sales on samples*.—Sales on samples are more common in Bombay, Sind and Bihar and only to a limited extent in the Central Provinces. *Datals* or *kuchcha arhtiyas* draw samples from heaps or bags and take them to *pucca arhtiyas* and other prospective buyers for inspection. Prices are settled on the basis of samples so exhibited. In Sind, the produce is usually weighed in or near villages and the producer himself takes samples to buyers in the adjacent towns or near railway exporting centres. These samples are left with the buyers for comparison with the bulk of the produce at the time of delivery. Buyers watch the gram when it is being weighed and if they find the quality in any way inferior to the sample, they make deductions from the stipulated price which are usually higher than what it should be.

Small bags containing samples are also sent from the main producing centres such as Jubbulpur, Godawara, Bundelkhand, etc., particularly to Bombay and Madras. On the basis of these samples, the prices are quoted and bargains struck.

(b) *Sales on fair average quality*.—The system of sale on fair average quality is popular in the Punjab and the United Provinces and to a limited extent in Bihar also. The fair average quality, as has been described in the Report on the Marketing of Wheat in India, is the quality consisting of all grades of the produce brought to the market and sold at a flat rate. This is commonly known as *dara*. The fair average quality of each market is, however, different and buyers usually make bids or offers after inspecting the produce. The buyers in consuming centres are aware of the fair average quality of the various markets from their experience and they freely place orders with their commission agents in the producing centres. When large quantities are purchased, however, buyers visit the producing centres themselves or send their representative to make purchases, after inspecting the produce. In distant consuming centres, such as Madras, local merchants have almost entirely to depend on samples or on their experience of the qualities produced in the various centres.

(c) *Sales on standard contracts*.—As there is not much export in gram there are no standard contracts for export trade in gram. For the internal trade, however, there are contract forms both for "ready" and "futures". The "ready" delivery contracts are in vogue only in port towns such as Bombay. A copy of the rules framed by the Merchants' Chamber of Commerce Ltd., Bombay, providing for the terms of contract in respect of "ready" deliveries is given in Appendix XXXIX. "Futures" contract forms have been adopted by the various merchants associations dealing in "futures" trade. The basis of refection for "futures" transactions adopted by some of the associations in India is given in Appendix XXXVIII. It will be seen that free tolerance for dirt varies between 1 and 2 per cent. while the rejection points range from 1.5 to 3 per cent. Deductions, if in excess of tolerance are, however, usually at full value except at Ludhiana where half the value is allowed.

In the case of admixtures with barley, wheat and other grains, the variation in free tolerance is large—ranging between 0.5 per cent. at Bhiwani and 9.0 per cent. at Aligarh. In the latter place the option of rejection under this head is as high as 17 per cent. Deductions, if in excess of tolerance, are allowed from half the value to full value. Most of the associations have no specified limits for shrivelled and damaged gram. No provisions have been made in the rules in this respect, probably because no disputes have arisen and the necessity of putting a limit has not so far been felt. The existing scale for weevilled gram, however, varies from place to place according to the month of delivery. Till July-August, gram is usually free from weevil attack but as the rainy season advances the incidence of weevil attack increases. The tolerances allowed for weevil attack also increase progressively month by month after July-August. Certain associations do not provide for free tolerance in respect of weevilled grain but have fixed maximum percentage in excess of which there is option to reject. Appendix XL gives the tolerances allowed for weevilled gram in different months by a few associations. As in the case of wheat\*, the description of gram tenderable, the units of sale and the cover money required from the buyer and the seller, dates of settlement and conditions of delivery differ considerably from association to association. General terms governing delivery, payment, arbitration, etc., in local contracts, however, are more or less the same in all cases.

\* It may be mentioned that at present (1943) all future transactions have been banned by the Government temporarily due to the abnormal conditions created by the War.

† Attempts have been made by the Central Agricultural Marketing Department to remove local differences and to establish a uniform system of contracts for wheat. Efforts on similar lines will be made to provide standard contract forms acceptable to the interests concerned for gram as well, but this will perhaps not be feasible till conditions become normal again after this War.

\* Report on the Marketing of Wheat in India, pp. 192-194.

† Report on the Marketing of Wheat in India, p. 190.

## CHAPTER VI.—PROCESSING AND DISTRIBUTION OF GRAM PRODUCTS.

## A.—Processing.

As has already been mentioned in a previous chapter, gram is consumed in the form of *dal*, *baisin*, gram *ata*, crushed gram or as whole gram boiled or parched. In the manufacture of *dal*, gram is passed through *chakkis* for splitting the grain and separating the husk and the kernel, while *baisin* and gram *ata* are prepared by milling *dal* and gram respectively. Hand *chakkis* are used for this purpose, particularly in rural areas, but their place is being gradually taken up by small power-driven mills. *Chakkis* driven by bullocks or camels known as *Kharas* are also in use in the Punjab. Waterfalls of some of the canals are also utilized for grinding grain in the Punjab and the United Provinces. Power-driven *chakkis* worked by oil engines or electricity are in common use throughout the country chiefly in urban areas and bigger villages. Their number has increased at a very rapid pace mainly due to the availability of cheap hydro-electric power, particularly in the United Provinces and the Punjab. All these *chakkis* are set up mainly for grinding wheat,\* but other grains including gram are also processed in these. Roller mills grinding wheat flour are similarly utilized for making *baisin* from gram *dal*. There are, however, some roller mills which are engaged exclusively on making *dal* or *baisin* or both. The number and location of some such mills and approximate quantity handled in normal times are given in Appendix XLI.

## (1) METHODS AND COST OF MANUFACTURING GRAM PRODUCTS.

(a) *Dal*.—Gram *dal* is of two types, viz., unpolished and polished. The initial processing for both the qualities is similar. Gram is first cleaned of dirt and stones and water is sprinkled on it, after which it is collected in a conical heap and left overnight. The heap is then dried in the sun on the following day. (In certain places, e.g., in certain parts of the Punjab, the grain may be soaked in water for a few minutes only). Treating the grain with water by sprinkling or soaking softens the husk and the latter is removed easily in the *chakki* without much breakage of the kernel. The *dal* produced in this manner is the ordinary unpolished *dal*. In the manufacture of polished (coloured) *dal*, a fine stream of dilute turmeric solution is allowed to fall on the dry *dal* immediately as it comes out of the mill. This treatment gives the product an attractive yellow colour. In certain places, yellow pigments other than turmeric are also used for the purpose. For example, at Abohar (Punjab), yellow colour of “cow brand” is used in the proportion of 1:640. The price of polished *dal* is usually less by about 1 to 2 annas per maund as compared with the unpolished *dal*. This is due to the fact that moisture absorbed during the process of colouring increases the weight of the product, thus enabling it to be sold at a lower rate. This type of *dal* is more popular in Delhi, Madras, Bombay and Calcutta but in the Punjab and the United Provinces, unpolished *dal* is preferred.

The ordinary polished *dal* is known as *bharwa* (full) *dal* in the Deccan districts of the Central Provinces, Bombay Province and H. E. H. the Nizam's Dominions where it is consumed by Gujratis, Madrasis and North Indians residing in that area. The local population of the tract, however, prefer a special type of *dal* known as *khol* (empty) *dal*. The method of its preparation is somewhat different from what has been described above. Gram is soaked in water for about 10 minutes and is then left in conical heaps for about 48 hours. It is then soaked in water again for 2 days. After this the wet gram is taken out and left in conical heaps for 6 hours. Thereafter it is dried in the sun for a day in summer and for 2 days in winter. Gram is then ready for being processed into *dal*. The grain so treated absorbs much more moisture (about 5.0 per cent. of the weight of *dal*) and the resulting pulses develop a concavity at the flat end.

The outturn of *dal* from a given quantity of gram and its by-products—*chuni* (brokens) and husk—varies in different tracts depending on the method of preparation. The following table gives the approximate percentage recovery of *dal* and by-products in the main producing areas of India:—

—	Dal.	Chuni.	Husk.	Dirt.
	Per cent.	Per cent.	Per cent.	Per cent.
United Provinces . . . . .	70.0	17.5	7.5	5.0
Punjab . . . . .	67.5	19.5	8.0	5.0
Bihar . . . . .	66.6	20.0	6.4	7.0
Bombay . . . . .	75.0	13.5	7.5	4.0
Central Provinces . . . . .	72.5	16.5	7.5	3.5
H. E. H. the Nizam's Dominions .	75.0	12.0	6.0	7.0

\*For details please see pages 293-301 of the Report on the Marketing of Wheat in India.

It will be noted that the outturn of *dal* is lower in the United Provinces, Punjab and Bihar than in Bombay, Central Provinces, and H. E. H. the Nizam's Dominions. This difference is partly due to the fact that in the latter tracts gram is kept in water for a longer period than in the former.

**Cost of preparing *dal*.**—The cost of preparing *dal* by hand *chakki* or power-driven *chakki* includes the cost of transportation of gram from the market to the manufacturer's premises, charges for cleaning, grinding and weighing, and interest and depreciation on the capital outlay. The cost of making *dal* by hand *chakkis* at small manufacturing establishments consists of wages paid to labour the normal rate of which was found to vary from 2 to 3 annas per maund of gram crushed. Sometimes payment is made in kind where husk obtained from the grain crushed is made over to the labourer. In this connection, it may be mentioned that in the Bombay Province there are itinerant professional *dal* makers who roam about and convert gram into *dal* as and when required. Their charges are about 4 annas per maund of *dal* made.

***Kharas*** used in Northern India are run by carpenters who usually charge Re.  $\frac{1}{3}$  per maund for grinding alone. Adding to this 9 pies as the cost of cleaning and winnowing, the total cost works out to 2 annas per maund. About 2 maunds of gram is crushed in one hour in a *kharas*.

The power-driven *chakkis* are worked either by oil engines or by electricity. The cost of making *dal* varies in different areas. In the Punjab, the cost in normal times is reported to be Re.  $\frac{1}{3}$  for crushing (splitting) one maund of gram. In the Central Provinces, the rate charged by flour mills for crushing gram into *dal* is reported to be 2 annas per maund at Damoh, 4 annas per maund at Saugor and 4 to 5 annas per bag of  $2\frac{1}{2}$  maunds at Nagpur.

In the United Provinces the cost of preparing *dal* from a maund of gram is estimated to vary between 4 and 5 annas.

In Poona where *khol dal* is prepared in large quantities, the details as stated by a mill owner for making *dal* on his own account are given below:—

	Rs.
Cartage of 1,500 maunds of gram to <i>chakkis</i> . . . . .	75
5 men on Rs. 20 per month for doing the processing . . . . .	100
Consumption of electricity per month . . . . .	20
Interest on capital, rent, depreciation, etc. . . . .	100
For processing 1,500 maunds of gram . . . . .	295
or about Re. 0.3-2 per maund of gram processed.	

In H. E. H. the Nizam's Dominions the cost of manufacturing *dal* from a maund of gram by various methods is given below:—

	Hand chakkis.	Bullock driven chakkis.	Electric driven chakkis.	Roller mills.
	As. P.	As. P.	As. P.	As. P.
Transportation . . . . .	0 4	0 4	0 4	0 4
Soaking and drying . . . . .	1 7	0 11	1 2	0 6
Grinding, sorting and winnowing . . . . .	2 0	2 2	1 6	1 0
	3 11	3 5	3 0	1 10

(b) **Baisin.**—In the manufacture of *baisin*, gram *dal* is ground into a fine meal either in stone *chakkis* or in roller mills, and the resulting meal sifted through a fine sieve to separate coarse particles. Whereas in stone *chakkis* usually only one kind of *baisin* is recovered, in roller mills several grades (usually 2 or 3) of the product are obtained by the use of sieves having meshes of different sizes. The cost of processing gram *dal* into *baisin* varies in different tracts. For example, in the Punjab, the charges are estimated to average 2 annas per maund while in the United Provinces they are said to vary from 2 to 3 annas per maund. In the Central Provinces, the cost works out to about 2 annas per maund in the case of electrically driven plant and Re. 0.1-6 in the case of factories run by crude oil engines. The charges given above do not include wastage (0.5 to 1.0 per cent.) during processing.

It may be mentioned in this connection that pea and *lang* (*Lathyrus sativus*) *ata* is often mixed with *baisin* as these two pulses are cheaper than gram and having yellow colour lend themselves for convenient adulteration. The manufacturers of fried *baisin* products, it is stated, also prefer the adulterated stuff as pea and *lang* flour absorb smaller quantity of fats.

(c) *Gram meal (dana) and ata*.—Gram of the poorest quality is used for the preparation of gram meal for livestock. The process is simple. Gram is crushed into hand or power-driven *chakkis* or grain kibblers. The cost is practically the same as that of grinding *dal*, i.e., between Re. 0-1-6 and Re. 0-2-6 per maund. Gram *ata* is prepared in the same way as gram meal except that the grain is milled like wheat into *ata*. The loss in processing is about  $\frac{1}{4}$  seer per maund in the case of gram *ata* and very little, if any, in the case of gram meal.

(d) *Parched gram*.—Parched gram is prepared usually by a class of people known as *bharbhujas* (grain parchers). Before parching, gram is cleaned and sieved and then moistened with pure or turmeric-coloured water. In certain places, salt is also added to the water before it is sprinkled on the grain. The use of turmeric not only gives the characteristic yellow colour to the grain but also produces a mild fragrance in the product on account of which it fetches a premium above the ordinary untreated product. Parching is done in the usual manner in hot sand in an oven. On parching the husk cracks open and partially exposes the fried kernel inside. Parched gram *dal* is made by rubbing parched gram lightly by a wooden roller whereby the husk is removed from the grain and the pulses separated.

The cost of parching gram varies from 12 annas to Rs. 1-4 per maund, depending on the locality and the method of parching. For instance, the cost is lower in rural areas than in towns on account of fuel being more cheaply available in the former. Similarly, other things being equal, the cost of parching with turmeric and salt will be higher than if the grain is parched untreated. In the Punjab, the cost of parching a maund of gram is stated to be 10 annas consisting of wages (2 annas) and fuel (8 annas). Adding to this over-head charges at the rate of 1 anna per maund, the total cost would come to 11 annas per maund. In the United Provinces, the average cost of parching gram comes to 12 annas per maund. In H. E. H. the Nizam's Dominions, the total cost is estimated at 13 annas per maund including 6 annas on account of fuel, 6 annas for labour and 1 anna for miscellaneous items. When the produce is salted and coloured, an additional expenditure of about 4 annas per maund is incurred. The manufacture of parched *dal* costs another 4 annas per maund incurred in connection with rubbing the grain and cleaning the husk. The total cost of preparing parched gram *dal* works out on an average to about one rupee per maund of gram.

(e) *Gram sattu*.—Gram *sattu*, which is prepared from parched gram, is made throughout Northern India, more particularly in Bihar, Bengal and the eastern United Provinces. The process is simple. Parched gram is ground usually by hand *chakkis* with or without the husk. In calculating the cost of processing *sattu*, an addition of 2 annas per maund may be made to the cost of parching, thus giving a total average of 14 annas per maund.

(f) *Other kinds*.—In addition to the above mentioned products, another most commonly used product is the boiled gram sold at urban centres, *hats* or periodical markets. *Kabuli* gram is preferred for this purpose. In its absence, however, bold varieties of *desi* gram are also employed. There are several methods of preparing boiled gram. Generally the grain is soaked overnight in water containing small quantities of sodium bicarbonate. Next morning the water is thrown away and the grain is washed with fresh water and boiled. Salt, chillies, garlic and sometimes onions are then added after removing the superfluous water. The grain is then fried in mustard or *til* oil or ghee. Before consumption, powdered *zira* (cumin), coriander and pepper are sprinkled on the boiled product. The total cost of processing is stated to be about 6 annas per seer of raw gram.

*Flat gram (chana-jor-garam)*.—This kind of gram is very popular among children, particularly in urban areas. In preparing it, gram is soaked in water for a night. Next morning, the grains are flattened by beating with a wooden paddle and left for a short time under the sun to dry and then fried in mustard oil along with powdered chillies, pepper, salt, etc.

*Sugar-coated gram*.—*Gur* or sugar is boiled with water and when the syrup has reached the required consistency, parched husked gram or parched *dal* is mixed with it. The syrup and the gram or *dal* are then briskly mixed together. The syrup adhering to the individual kernels solidifies forming a fairly thick coating of sugar. The grains may be kept separate or made into round balls or small flat cakes.

## B.—Supply of gram products.

Statistics relating to inter-provincial movements of gram products are not published separately. During this survey, however, a rough estimate of the imports and exports of gram *dal* and *baisin* into and from various provinces and States has been made (Appendices XLII and XLIII), there being little or no inter-provincial trade in other products.

(a) *Dal*.—As will be seen from the appendix referred to above, the production of *dal* is highest in the Punjab being about 100,000 tons, followed by the United Provinces where about 62,000 tons of *dal* is produced annually. Other important areas of gram *dal* production are Bombay, Bengal, Bihar, Central Provinces, H. E. H. the Nizam's Dominions, Rajputana and Central India States. Normally about 37,000 tons of *dal* is exported every year from the Punjab mainly to Madras, Bombay and Sind, while the despatches from the United Provinces approximately average a total of 10,000 tons chiefly to Bengal, Madras Bihar and Bombay. Rajputana and Central India States

export *dal* chiefly to Bombay and H. E. H. the Nizam's Dominions. Sind exports considerable quantities of gram *dal* by sea mainly to the ports of the western seaboard and to Madras. Among the importing tracts, Madras imports the largest quantity of *dal* (37,000 tons), followed by Bengal (16,000 tons). The trade in gram *dal* in other provinces and States is small.

As has already been mentioned, there are two types of *dals* prepared in Northern India—wet or polished and unpolished. In the chief producing centres, unpolished *dal* is preferred to the polished or wet *dal*. The polished *dal* prepared in the Punjab and the United Provinces is despatched to Madras, Bombay and Bengal. In Bombay, the Central Provinces and H. E. H. the Nizam's Dominions *khol dal* as described on a previous page is prepared in large quantities. Gram *dal* is usually free from dirt and foreign matter and its quality is determined by colour and percentage of brokenes.

(b) *Baisin*.—As already stated, *baisin* is produced by milling *dal* into flour. Large quantities of *dal* are processed by consumers themselves into *baisin*. In this section only that portion of *baisin* which is made in large sized roller mills for wholesale markets is dealt with. Appendix XLIII shows the estimated quantities of *baisin* manufactured and its imports and exports into and from the different trade blocks based on the enquiries made during the survey. It will be seen that the largest quantity of *baisin*, 46,000 tons, is produced in H. E. H. the Nizam's Dominions, followed by Punjab (43,000 tons), Bombay (42,700 tons) and the United Provinces (31,000 tons). The largest exports are from the Punjab (20,000 tons) followed by the United Provinces (9,000 tons). Madras and Bengal are the chief consuming centres importing 14,000 and 8,000 tons respectively. The largest demand for *baisin* is in H. E. H. the Nizam's Dominions and Bombay where *baisin* is used in a number of preparations.

There are numerous brands of *baisin* available in the market. For instance, in the Hubli market five types are imported from Karachi, namely, Sword Brand, Knife Brand, Hammer Brand, Bharat Brand and Light Brand. Out of all these brands, the first which is very fine and is said to be free from adulteration, is considered best.

Flour of *lang* and other cheap pulses is often mixed with *baisin* in order to produce a cheaper product.

(c) *Crushed gram (dana) and ata*.—The total quantity of gram crushed for cattle feed is estimated at 221,000 tons, the largest quantity (81,000 tons) being made in the Punjab, which is perhaps the only province exporting crushed gram. Moghalpura (Lahore) is the chief exporting centre for this product and normally sends every year about 6,000 tons to the various military depots in the United Provinces, Baluchistan and the North-West Frontier Province, the rest of the product being consumed in the province itself.

There is no inter-provincial trade in gram *ata*. The total quantity of gram *ata* produced exceeds 200,000 tons and the whole quantity is consumed in the areas of production.

(d) *By-products*.—*Chooni* and husk are the by-products of *dal* manufacture. The yield of *chooni* and husk per 100 maunds of gram differs from place to place as is shown on page 45. *Chooni* is a mixture of smaller grains of *dal* and husk. The production of *chooni* and husk in India is estimated at about 160,000 tons and 70,000 tons respectively (see Appendix XLIV). Since these by-products are used as cattle feed and are in normal times quite cheap, they do not generally enter the inter-provincial trade. The Punjab and the United Provinces are the chief producing areas of these by-products but they export only 3,000 tons to 4,000 tons of *chooni* and about a thousand tons of husk to the military depots in the neighbouring provinces.

### C.—Demand.

(a) *Gram dal*.—Gram *dal* is used both for cooking as pulse and for frying. The demand for *dal* for cooking is more or less uniform but fried *dal* is consumed to a greater extent in winter and in the rainy season. In certain parts of the country, gram *dal* is also the chief ingredient in the preparation of sweet *laddoos*, e.g., in the Central Provinces. Besides, sweet gram *dal* and sweet *puris* (*pooran pallis*) are other noteworthy products made from *dal* in the Central Provinces, Deccan and in H. E. H. the Nizam's Dominions.

(b) *Baisin*.—*Baisin* is required for most of the confectionery sold in the bazar and in hotels, such as *bhajis*, *sev*, *gathia*, *laddoos*, etc. It is also used in the preparation of *kababs* and omelette. In this connection, it is interesting to observe that the increased consumption of tea in recent years is said to be responsible for a greater demand for *baisin* and *dal* for the preparations of gram products which are generally served with afternoon tea, particularly in the Bombay, Madras and the Central Provinces. The demand for *baisin* is the highest during the rainy season and winter.

The demand for gram *ata* is confined to the United Provinces, the Punjab, the Central India and Rajputana. It is mostly used for mixing with wheat and or barley *ata* for making *roti* (bread). Crushed gram or gram meal is mostly consumed in summer months for feeding draught animals, as work during these months is more exacting.

Parched gram and its products are in demand more or less throughout the year but since it has a heating effect on the human system, it is used in comparatively smaller quantities during April-June. In Gujarat and Deccan, it is considered auspicious to take some parched gram on Fridays. *Chooni* and husk are given to milch cattle and their consumption is comparatively high during the period October to March which is the chief lactation period of buffaloes.

**D.—Relation between the prices of gram and its products.**

The average monthly wholesale prices of gram, gram *dal*, *baisin chooni* and husk at Datia, Bombay and Ahmedabad are compared in Appendices XLV to XLVII and are summarized below :—

*Average annual wholesale prices of gram and gram products.*

—	1937.	1938.	1939.	1940.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
<i>Datia.</i>				
Gram . . . . .	2 4 5	2 3 3	2 13 5	2 12 8
Dal . . . . .	3 3 2	3 2 7	3 14 3	3 13 10
<i>Bombay.</i>				
Gram . . . . .	3 5 6	3 7 2	4 6 9	4 5 8
Dal . . . . .	3 10 8	3 14 5	4 15 9	5 4 8
Baisin . . . . .	3 14 3	4 2 8	5 1 9	5 5 10
<i>Ahmedabad.</i>				
Gram . . . . .	2 15 4	3 3 1	4 2 6	4 4 5
Dal . . . . .	4 3 1	4 1 9	5 7 9	5 8 1
Baisin . . . . .	4 4 0	4 3 11	5 7 11	5 10 4
Chooni . . . . .	2 6 3	2 6 3	2 15 2	2 14 6
Husk . . . . .	0 15 5	0 15 3	1 1 3	1 1 6

It will be seen from the above figures and the diagrams facing pages 43 and 49 that although the prices of gram products have a tendency similar to those of gram, the close concordance witnessed in the case of the prices of wheat and wheat products is lacking. This holds good particularly in the case of consuming centres. For example, in Bombay, an important consuming centre, the prices of gram *dal* have been higher than those of gram by 9·7 to 23·2 per cent. a range of 13·5 per cent. At producing centres, on the other hand, the difference in the prices of gram and gram *dal* was found to be more regular. For instance, at Datia, the price of gram *dal* was above gram price by 37·1 to 43·5 per cent. or a range of 6·4 per cent. only. In this connection, it may be observed that in the case of Bombay both gram and *dal* are imported from up-country and the prices of the two commodities are naturally not so closely linked together as at a producing centre where the price of the raw material (gram) has, as it should have, a relatively greater influence on the price of the product (*dal*). The difference between *dal* and *baisin* prices is even more irregular than that between gram and *dal* (see diagrams facing pages 48 and 49) which is perhaps due to the fact that *baisin* is liable to adulteration and its prices are more variable.

*Chooni* and husk are usually produced and consumed locally. As would be seen from the statement given above and diagram facing page 49, their prices follow the trend of *dal* fairly closely. Parched gram is usually not sold in wholesale. Nevertheless, its prices are found to be closely related to those of raw gram.

**E.—Distribution.**

Gram *dal* and *baisin* have comparatively wider distribution than crushed gram, parched gram, *chooni* or husk. These products are despatched in large quantities from places in Northern India to distant markets in the South. As a rule, the manufacturers despatch *dal* and *baisin* on consignment basis for sale in the consuming markets. Wholesale dealers in deficit areas also place orders direct with the manufacturers in which case prices are quoted on the basis of delivery at the despatching station, all the expenses till the goods are loaded in the railway wagon at the forwarding end being borne by the consignor. The railway freight and cost of handling and distribution are



borne by the buyer. In the Punjab, however, the more common system is to purchase through local commission agents. A typical price spread of a consignment of 100 bags of gram *dal* from Bhatinda (Punjab) to Baramati (Bombay) in pre-war days is given below :—

*Expenses at Bhatinda—*

	Rs. A. P.
Price of 100 bags (250 maunds) of <i>dal</i> . . . . .	542 15 6
<i>Dami</i> . . . . .	10 2 6
Handling . . . . .	2 5 0
Twin and depreciation on bags . . . . .	6 12 0
Cartage to station . . . . .	3 2 0
Commission . . . . .	4 2 3
Charity . . . . .	0 11 0
Miscellaneous expenses . . . . .	1 8 0
Postage . . . . .	0 13 0
Booking expenses . . . . .	1 9 0
Railway freight Bhatinda to Baramati . . . . .	330 11 8
	<hr/> 904 11 11 <hr/>

*Expenses at Baramati—*

	Rs. A. P.
Cartage from Railway station to godown . . . . .	4 11 0
Octroi . . . . .	4 1 0
	<hr/>
Total . . . . .	8 12 0
Total cost at Baramati . . . . .	913 7 11

or

Rs. 3 10 6 per maund.

Wholesale's costs and profit . . . . .	0 6 0 per md.
Wholesale price . . . . .	<hr/> 4 0 6 <hr/>

*Retail distribution.*—The cost of retail distribution includes cartage to the shop and other overhead expenses. The retailers of *dal*, *baisin* and crushed gram usually get a small margin (including profit) varying from 2 to 7 annas per maund which works out at 5 to 13 per cent. In the case of parched products, however, the margin is comparatively large as the retailer himself is the manufacturer and, therefore, entitled to the manufacturer's profits as well. The above is borne out by the wholesale and retail prices of gram products at Lahore in July 1937 given below :—

(Per maund.)

	Wholesale price.	Retail price.	Difference.
	Rs. A. P.	Rs. A. P.	Rs. A. P.
Gram <i>dal</i> . . . . .	3 4 0	3 10 0	0 6 0
<i>Baisin</i> . . . . .	3 7 0	3 14 0	0 7 0
Crushed gram . . . . .	2 7 6	2 9 6	0 2 0
Parched gram . . . . .	4 0 0	5 8 0	1 8 0
Parched <i>dal</i> . . . . .	5 0 0	7 8 0	2 8 0

## CHAPTER VII.—SUMMARY, CONCLUSIONS AND RECOMMENDATIONS.

## A.—Summary.

## Supply.

Gram is one of the important food grains in India. It is used both as a human food and for feeding livestock.

On an average for the quinquennium ending 1939-40, the total acreage under gram in India was 18 million acres which is roughly 5·3 per cent. of the total area under all crops. Nearly 73 per cent. of the total area under gram is in British India. Of this total the United Provinces, the Punjab, Bihar and the Central Provinces together account for about 88·7 per cent. Among Indian States, Hyderabad, Gwalior and Patiala are the most important.

The gram acreage in India does not show any definite trend. The area in the Punjab decreased from nearly 6½ million acres in 1933-34 to a little over 2 million acres in 1938-39, while there was no appreciable change in the area in the United Provinces and Bihar.

The average yield is highest in the Indo-Gangetic plains (between 600 and 750 lbs. per acre), followed by the Punjab (450 lbs.). The Deccan gives the lowest yield of about 350 lbs. per acre. The high yield in the Indo-Gangetic plains is due to better soil and more favourable seasonal and other conditions. The calculated average yield for the whole of India during the decade ending in 1939 was 503 lbs. per acre.

The total annual production in India amounted to about 4·4 million tons during the quinquennium 1935-36 to 1939-40, of which 74·9 per cent. was produced in British India and the balance in Indian States. This includes about 110,000 tons (2·5 per cent. of total) produced in areas not reporting the acreage and production of gram. The United Provinces produce more than 50 per cent. of the total production in British India followed by the Punjab (20·8 per cent.) and Bihar (13·2 per cent.). Amongst the Indian States, the production is the largest in the Hyderabad State. Punjab and Rajputana States are next in importance.

The colour of the grain is a very important quality factor, although such other factors as size, uniformity and soundness of grain also count as basis of quality. No systematic attempt, however, appears to have been made to classify the more important types on the basis of these factors.

Most of the commercial varieties are mixture of more than one colour, although the brownish shade predominates. What might pass as brown in one market might be regarded as yellow in another.

On the basis of the results of physical analysis of a large number of trade samples collected during this survey, gram may be classified into three broad divisions, viz., brown, yellow and white. The brown gram is by far the most important; but it comprises a good many shades, such as light to dark brown, yellowish brown, dusky and reddish brown. The Punjab produces various shades of brown and yellow types as well as the *kabuli* gram. The dark-coloured varieties are more common in the North-West Punjab while the yellow is grown mainly in Ferozepur district. In the United Provinces, there are three types, namely, yellow, brown of various shades and dusky. The lighter shades are more common in the Bundelkhand and Agra Divisions and the darker in the rest of the Province. The Bundelkhand grain is bigger in size than that of the Central and Eastern United Provinces. The two varieties are generally mixed up in the assembling and distributing markets in the United Provinces and marketed as *dara*.

The main varieties in Bihar are (i) *Bara dana* (large-grained) and (ii) *Chhoti dana* (small-grained). The larger grained variety is brownish in colour while the small grained variety is dark brown. In Hyderabad State, dark brown variety is the most common and covers about 90 per cent. of the total gram area in the State.

Of the improved types of gram, *Pusa* types 17, 18 and 25 are heavy yielders, while *Pusa 9*, yields a crop of high quality. The principal improved varieties evolved by the Punjab Agricultural Department are types No. 1, No. 7, No. 15, No. 17 and F. 8.

About 56 per cent. of the total crop is retained by the producer for his own requirements and the balance of 44 per cent. or 1,900,000 tons is left as marketable surplus. A fairly high proportion of the crop is retained in villages in the main producing area of Northern India. In the United Provinces and Bihar, for example, the percentage of the crop retained is approximately 70·0 and 80·0 per cent. of their respective production. The comparatively high percentage of the crop retained by the cultivator in the United Provinces, and Bihar is primarily due to the fact that in these areas gram is an important human and livestock food.

A major portion of the marketable surplus is disposed of in the assembling markets during the three or four months following the harvest. It is estimated that in most of the North Indian markets, roughly 75 per cent. of the produce is sold during April—July, the remaining 25 per cent. being distributed over the rest of the year.

During the quinquennium ending 1939-40, the annual imports of gram into India averaged a little over 17,000 tons. Burma was the chief source of imports accounting for more than 99 per cent. of the total, the remaining 1 per cent. being shared by Iraq, Ceylon and others. The province of Madras is the largest importer of gram, followed by Bengal.

Exports of gram from India were very irregular and show a declining tendency. During the quinquennium ending 1924-25, the total shipments amounted to just below 50,000 tons, while during the following five years, they fell to about 16,000 tons. Some improvement, however, took place during the quinquennium 1930-31 to 1934-35, but in the following years, exports fell again, being as low as 5,437 tons in 1939-40. The share of Sind in the export of gram has generally been the largest. Bombay comes second, while Bengal and Madras export only small quantities. The volume of export trade of India depends on the in-take of countries like United Kingdom, France, Netherlands, Germany and Egypt. Exports of gram to these countries are in dark coloured types, which are used mainly for feeding cattle and horses. Ceylon, Straits Settlements, Mauritius and other British dependencies import small quantities of gram of lighter colour as the main demand in these territories is for human consumption.

### Demand.

For human consumption, gram is used as boiled whole, ground *ata*, *baisin* and parched. Whole gram is boiled and salt and/or other condiments as well as lemon or lime juice are added to it. Gram *ata* is consumed in the form of a wholemeal. *Chapatis* are made usually after mixing it with wheat and/or barley *ata*. Gram and wheat *ata chapatis* are relished in Northern India. Gram *dal*, like other pulses, is cooked and taken generally with *chapatis*, though to a small extent, it is also consumed as fried *dal*. *Baisin* which is prepared by milling *dal* without husk is used in various forms for domestic purposes. *Halwais*, hawkers and hotel keepers use *baisin* in various preparations such as sweetmeats, *pakawras*, *seo*, *moongras*, etc. Parched gram is consumed with parched rice or barley, chiefly during travel. Parched gram with or without shell is ground into *sattu* which is mostly used in Bihar.

For stock feeding, gram is used in various forms such as whole grain, in crushed form and in combination with barley. *Choorā* (coarse meal) and gram husk, which are by-products obtained during the process of milling, are usually fed to animals.

The quantities used for preparing boiled whole gram are estimated to be not more than 84,000 tons. *Kabuli* gram is preferred for the preparation; but this quality not being available in sufficient quantities, bold types of yellow and red varieties are also used for the purpose.

The total market demand for gram for *ata* in this country is estimated at 239,600 tons or a little over 10 per cent. of the total marketable surplus. In the United Provinces, the consumption of gram in the form of *ata* is estimated at about only 14 per cent. of the total market demand, i.e., about 75,000 tons. In the Punjab, however, the quantities so used are large and amount to about 140,000 tons. Grains of various shades of colour are used for preparing *ata* but the yellow varieties are usually favoured, as the *ata* produced from these varieties has an attractive colour and mixes well with that of wheat and/or barley. The poorer classes, however, consume inferior dark brown varieties which are cheaper.

The United Provinces and the Punjab are the more important *dal* producing areas where 42 and 36 per cent. respectively of the total market demand, i.e., 250,000 and 175,000 tons of gram are processed into *dal*. Of these quantities, 75,000 tons in the United Provinces 45,000 tons in the Punjab are estimated to be used for making *baisin* alone. Large sized, well developed grains with thin shell are preferred for making *dal*. The bold yellow variety of the Punjab is more suitable for *dal* making than the brown and red varieties, as breakage in splitting is less in the former case.

The total market demand for gram for the manufacture of parched gram in India is estimated at about 284,200 tons or about 12 per cent. of the total marketable surplus. Bold grains of light colour are preferred for parching, but as this quality is not available in sufficient quantities, brown types are used for the purpose.

As regards stock feeding, it is estimated that of the total marketable surplus approximately 280,000 tons or 12 per cent. are utilised for this purpose.

### Wholesale prices.

Gram is considered to be an inferior food-grain in comparison with wheat. A comparison of the prices of the two, however, shows that in certain years gram was sold at par with or even dearer than wheat. Prices of gram are affected primarily by its production; and the supply or prices of wheat do not as a rule, influence them.

The prices of gram show a declining tendency in the pre-harvest months of January-February and are at their lowest during the post-harvest period from February to May. In the Central Provinces, the fall is rather sudden in February as the gram crop is harvested earlier in this province than in other tracts. In all the provinces the prices show an upward trend after the post-harvest period with a slight decline in June, the highest point being reached almost in all cases in December.

Excepting in the Central Provinces where the various varieties of gram are marketed separately on the basis of colour, no well-defined system of classification and trade description of gram for the purpose of price quotations exists anywhere. For example, in Bihar, where size of the grain is the chief quality factor, the bold grained type fetches a higher price of about one to two annas per maund as compared with the small grained quality while in the Central Provinces, there is a marked difference in the prices of different qualities. The *Peela* (yellow) sells dearer than the *Imalia* (Tamarind colour) while the *Gulabi* fetches the highest price.

Trading in "futures" in gram is confined only to a few markets in the United Provinces and the Punjab and to the port of Karachi. A comparison of the wholesale "ready" and "futures" prices of gram at Hapur and Karachi shows that there is a considerable concordance of movement between them and as in the case of wheat, the "futures" prices seem to have a stabilising effect on the "ready" prices.

Of the important producing areas first and final forecasts are issued by the Punjab, and a final forecast only by Bihar. It seems desirable that at least two forecasts, one after the sowing time and the other soon after harvesting may be issued by the United Provinces, Bihar and the Central Provinces as well.

Daily prices, both "ready" and "futures" are published in a number of English and Vernacular newspapers, in port towns and important markets in producing areas. Besides, the merchants in all important markets keep themselves informed of the latest prices in different markets. The cultivator has however, to depend mostly on the information which he may get on a visit to the market or from his fellow cultivator, village *baniya* or the itinerant dealer. In recent years, efforts have been made to disseminate market intelligence among the rural population by means of radio and gram prices are broadcast daily from the All-India Radio Stations, Delhi and Lahore, in respect of the Hapur and Amritsar markets respectively. The All-India Radio Station, Lucknow, also broadcasts gram prices at Cawnpore thrice a week.

#### Producer to consumer.

Cultivators themselves assemble large quantities of gram in the United Provinces, the Punjab, the Central Provinces, Bombay and the North-West Frontier Province. About 40 to 70 per cent. of the total marketable surplus of gram is handled by them in these different areas.

Village merchants are relatively more important in Bihar and the United Provinces where 90 and 60 per cent. respectively of the marketable surplus of gram is assembled by them.

Wholesalers collect the produce from villages mainly in Sind and to a small extent in the Central Provinces. Landowners also assemble gram in the North-West Frontier Province, the Punjab, Sind and the Central Provinces but the quantities handled by them are not large.

Besides the quantities brought to assembling centres, a small proportion of the produce is also disposed of in villages and periodical markets for consumption in rural areas.

The more important assembling markets for gram in the Punjab are Wambhacharan, Rohtak, Tohana, Dabwali, Budhlada, Kaithal, Moga and Abohar, each handling between 1 and 4 lakh maunds of gram annually. In the United Provinces, Agra, Kosi, Banda, Maudha, Atarra and Knuch are the chief assembling centres, each handling about a lakh maunds of the produce every year. In the Central Provinces, there is no market assembling more than 65,000 maunds of gram annually, but Jabulpore, Gotegaon, Pipariya, Raipur and Drug are relatively important. In Bihar, Patna, Dinapur, Shahabad, Gaya and Bhagalpur in the south and Darbhanga and Muzaffarpur in the north handle fairly large quantities. Jalgaon, Sholapur and Poona in the Bombay Province annually assemble above 1 lakh maunds of local gram.

No regulated markets have so far been established in the main gram producing belt in the north except in the Punjab. In the Central Provinces, Bombay and Hyderabad, gram is included in the commodities regulated under the respective Marketing Acts. In these areas, however, there are very few regulated markets where gram is assembled in large quantities.

As in the case of wheat, the total merchandising charges for gram are exorbitant in several areas. A number of unspecified or miscellaneous charges are levied. These charges do not bear any relation to actual services rendered. Where market charges are payable in kind, the seller has in actual practice to part with a substantially higher quantity than the declared rate. In order to enable the producer to get a fair return, it is essential that market charges should be regulated and standardised.

Among the indigenous methods of storage, the practice of storing gram in bulk in *pucca* godowns, with a layer of sand on the top, has been found to be quite efficient in keeping down losses in storage.

Gram and gram *dal* are included in the same class as grains and pulses for the purpose of Railway Goods Tariff. They fall under Class I for which the rate of 0.38 pie per maund per mile is charged. The bulk of the rail-borne traffic in gram is carried, however, at station-to-station rates which are lower than class rates.

There is only a small traffic in gram by internal waterways and this is confined mainly to the United Provinces, Bihar, Bengal and Assam.

In the Punjab, there are two distinct exporting tracts, one in the north-west, comprising the districts of Mianwali and Shahpur and the other in the south-east including the districts of Hissar, Rohtak, Ferozepore, Karnal, Gurgaon and Ludhiana. From the point of view of both production and exports, the latter is more important. This tract is contiguous to the Indian States of Patiala, Faridkot, Nabha and Jind on the south-east and Bikaner in Rajputana towards the south, all of which are important for export of gram. Bhatinda in the Patiala State is the most important gram market. Kotkapura in the Faridkot State, Jaitu in Nabha and Jind are the other important exporting markets for gram.

The bulk of the gram arrivals in Sind is by rail. The Punjab Province contributes over two-thirds of these arrivals, the balance coming from Rajputana and the United Provinces. The exports from Karachi are mainly by sea, though negligible quantities are also sent from there by rail and road to Baluchistan, and Bahawalpur and Jaisalmer States. In coastal trade, the Madras ports are chief destinations.

The Indian States in Rajputana and Central India are important producing and exporting tracts for gram. Morena and Bhind in the Gwalior State, Sriganganagar in Bikaner, and Indore, and Datia in Central India figure prominently in gram exports.

United Provinces is an important gram exporting area. The chief export markets for gram in this province are Kosi, Muttra, Agra, Hathras, Aligarh, Orai, Kalpi, Banda and Cawnpore.

Bihar is another important province for the export of gram. It sends out large quantities of the grain to the adjoining areas of Bengal and Assam, the chief exporting districts being Shahabad, Patna, Gaya, Monghyr and Bhagalpur. The province also imports gram and gram products. Jamshedpur and Dhanbad in the Chotanagpur Division, import the grain and its products from the Central Provinces. Small quantities are also imported into the province from the United Provinces.

The Central Provinces exports gram to Bihar, Orissa, Bombay, Madras, Hyderabad (Deccan) and Mysore.

Bengal exports very little gram to other provinces. A small quantity of Patna gram imported from Bihar is, however, re-exported to the neighbouring province of Assam mostly by boats from Bhairab-Bazar and Mirkadim. Similarly, some of the gram imported from the Central Provinces, Bihar and the United Provinces is re-exported by sea and by rail to the province of Madras. Bengal, however, imports large quantities of gram for its own consumption from Bihar, the United Provinces and Central Provinces.

Bombay imports mostly by rail and to a small extent by sea. Besides Bombay city itself, the main importing centres are Bijapur, Jalgaon, Sholapur and Poona.

In the Hyderabad State, the cities of Hyderabad and Secunderabad are the chief consuming centres, importing from the United Provinces and Central Provinces.

The province of Madras is the most important gram consuming area in India. Madras city alone imports 10 to 15 lakh maunds of gram by rail every year, principally from the Punjab, the Punjab States and the United Provinces. Bellary in the Ceded districts imports annually 60,000 maunds of gram from the Gwalior State and the United Provinces, while Nandyal and Rajahmundry together take on an average about fifty and thirty thousand maunds respectively from the Punjab, Punjab States and the United Provinces.

The traffic of gram and gram products by road is relatively small. There is some movement of this type between the British territory of the Punjab and the adjoining Indian States. The United Provinces also imports substantial quantities of gram. It is estimated that about 5 lakh maunds of gram are imported in the province by road from the adjoining States of Rajputana and Central India. There are, however, very little exports by road from this province. The Central Provinces similarly take about 100,000 maunds of gram from Bhopal State but export only about 2,000 maunds by the road route.

The export trade of the Punjab gram from Karachi to Madras ports has been falling off in recent years. This is mainly due to the fact that railways have provided reduced station-to-station rates between exporting markets in North India and importing centres in Madras and much of the trade which used to pass by the coastal route is now being handled by railways. The diversion has apparently been further accentuated by the fact that the N. W. Railway, unlike certain other railways, does not give any concessional rates on gram exported to Karachi, so that the rail-borne portion of the traffic which used to pass through this part has become disproportionately costly.

The bulk of the wholesale distribution of gram is in the hands of *pucca arhatiyas*. In the local distributive trade, the *pucca arhatiya* acts as the principal and transacts business through *dalals*. In the export trade, he acts as a commission agent for local merchants or importers in other markets. There are a few consumers' co-operative societies in India retailing gram but the quantity distributed by them is exceedingly small.

### Grading and standardisation.

The important factors for judging the quality of gram are colour, the proportion of impurities and size of grains. The ratio of husk to kernel is also taken into account by the *dal* manufacturers. White is considered to be the best colour. Next in order of importance come yellow and brown. The bulk of gram produced in this country is, however, brown in colour, followed by yellow and white. Impurities in gram consist of (i) dirt and other foreign matter, (ii) other food grains such as barley, and wheat, (iii) non-food grains, e.g., oilseeds, (iv) shrivelled or immature grains, (v) damaged and touched grains, and (vi) weevilled grains. The presence of dirt, stones and foreign matter is mainly due to the reason that the threshing of gram is usually done on *kachcha* floor, while barley, wheat, oilseeds, etc., are found as impurities in gram for the reason that gram crop is grown as a mixed crop and threshed on the same floor with other food grains and oilseeds. Defective methods of storage are responsible for weevilled grains.

The total refraction was found to vary considerably in the produce of the different tracts. The samples from North-Western Punjab had the lowest impurity content of 3.67 per cent. while those from Central and South-Eastern tracts of the province contained 4.88 and 4.90 per cent. of impurities respectively. The produce of Western United Provinces showed an average refraction of 7.16 per cent. that of Eastern United Provinces 9.49 per cent. and of Bundelkhand 18.70 per cent. The impurity content in Bihar samples averaged 16.99 per cent.

The weight in pounds per bushel is an index of plumpness of the grain and is, therefore, of considerable value in determining the quality of such grain. The average natural test weight in this country varies from 58.5 lb. in Bundelkhand (U. P.) to 62.27 lb. in the North-Western Punjab.

The ratio of shell to kernel is 1 to 4.96 in the Western United Provinces, 1 to 4.2 in Bundelkhand and 1 to 4.6 in Eastern United Provinces while in Bihar it is 1 to 4.27. In the South-Eastern Punjab, the ratio is 1 to 4.52 which is a little higher than in the North-Western and Central Punjab, viz., 1 to 4.27 and 1 to 4.28 respectively. The average ratio for the samples from Sind was 1 to 5.19 which is the highest while the lowest, viz., 1 to 4.20 was recorded in the case of samples from the Bundelkhand tract in the United Provinces.

Sales on samples are common in Bombay, Sind and Bihar, where prices are settled on the basis of samples. Buyers keep the samples and compare with them the bulk of the produce at the time of its delivery. If the buyer finds the quality in any way inferior to the sample, deductions are made from the stipulated prices. The system of sale on the basis of *dara*, or fair average quality is popular in the Punjab, the United Provinces and the Central Provinces. The buyers in consuming centres know the fair average quality of the various markets from their experience and often place orders with their commission agents in the producing centres without previous inspection of goods. If, however, large quantities are involved, buyers themselves visit the producing centres or send their representatives for making purchases. In distant consuming centres, such as Madras, local merchants have almost entirely to depend on samples or on their experience of the qualities produced in the various centres.

As there is not much export in gram, there are no standard contracts for the export trade in gram. For the internal trade, however, there are contract forms both for "ready" and "future" deliveries. The "ready" delivery contracts are in vogue only in port towns such as Bombay.

As in the case of wheat, the description of gram tenderable, the units of sale and the cover money required from the buyer and the seller, dates of settlement and conditions of delivery differ considerably between different associations. General terms governing delivery, payment, arbitration, etc., in local contracts, however, are more or less the same in all cases. Attempts have been made by the Central Agricultural Marketing Department to remove local differences and to establish a uniform system of contracts for wheat. Action on similar lines may be taken in respect of gram as well on return of normal conditions after the War.

### Processing and distribution of gram products.

*Dal*, *baisn*, gram *ata*, boiled whole gram, parched gram and crushed gram are the chief gram products consumed in this country. *Dal* is prepared by splitting the grain and dehusking the kernel. Gram is passed through *chakki* and husk is sifted from *dal*. The average outturn of *dal* and its by-products—*chuni* (broken) and husk for the different tracts works out to 71 per cent., 18 per cent. and 7 per cent. respectively the balance of 4 per cent. being dirt. The cost of preparing *dal* from a maund of gram may be put, on an average, at Re. -/2/6.

*Baisn* is made by grinding gram *dal* into a fine meal either in stone *chakkis* or in roller mills. The meal so obtained is then passed through a fine sieve for separating coarse particles. The average cost of processing gram *dal* into *baisn* comes to about 2 annas per maund. This does not include wastage (0.5 to 1.0 per cent.) during processing. It may be mentioned in this connection that pea and lang (*Lathyrus sativus*) flours being yellowish in colour and cheaper than *baisn* are often mixed with the latter as adulterants.

Gram *ata* is prepared by grinding gram in stone *chakkis* like wheat. Gram meal which is fed to livestock is also processed in stone *chakkis* but is coarser than gram *ata*. The cost of processing gram meal is practically the same as that of grinding *dal*.

Parched gram is prepared by roasting the grain in hot sand in an iron pan over an oven. Parched gram *dal* is made by passing wooden rollers over parched gram lightly, whereby the husk is removed from the grain. The cost of parching gram varies from 12 annas to Rs. 1/4 per maund, depending on the locality and the method of parching. The total cost of preparing parched gram *dal* works out, on an average, to about one rupee per maund of gram.

Gram *sattu*, which is prepared from parched gram, is made usually by hand *chakkis*, with or without husk. The cost of processing *sattu* comes to about 14 annas per maund.

Gram *dal* and *baisin* are, however, the chief gram products in which there is considerable inter-provincial trade. The production of *dal* is largest in the Punjab which produces about 100,000 tons annually. It is followed by the United Provinces, where the annual production is estimated at about 62,000 tons. Other important producing areas are Bombay, Bengal, Bihar, Central Provinces, H. E. H. the Nizam's Dominions, Rajputana and Central India States. Normally about 7,000 tons of *dal* are exported every year from the Punjab. The exports are mainly to Madras, Bombay and Sind. The United Provinces send out 10,000 tons of *dal*. The exports are mainly to Bengal, Madras, Bihar and Bombay. Rajputana and Central India States export *dal* chiefly to Bombay and H. E. H. the Nizam's Dominions. Sind exports large quantities of gram *dal* by sea chiefly to the ports of the western coast and to Madras. Among the importing tracts, Madras imports the largest quantity of *dal* (37,000 tons), followed by Bengal (16,000 tons). The trade in gram *dal* in other provinces and States is small. Gram *dal* is usually free from dirt and foreign matter and its quality is determined by colour and percentage of broken.

The largest quantity of *baisin*, 46,000 tons, is produced in H. E. H. the Nizam's Dominions, followed by the Punjab (43,000 tons), Bombay (42,700 tons) and the U. P. (31,000 tons). The largest exports are from the Punjab (20,000 tons) followed by the U. P. (9,000 tons). Madras and Bengal are the chief consuming areas importing 14,000 and 8,000 tons respectively. The highest consumption of *baisin* is in H. E. H. the Nizam's Dominions and Bombay.

The total quantity of gram utilised for feeding cattle is estimated at 221,000 tons. The largest quantity of this product (81,000 tons) is made in the Punjab. Moghalpura (Lahore) is the chief exporting centre, normally sending about 6,000 tons annually to the various military depots in the United Provinces, Baluchistan and the N.-W. F. P.

The prices of gram products do not show a close relation with gram prices as is the case with prices of wheat and wheat products. This is particularly so in the case of consuming centres. The difference between *dal* and *baisin* prices is even wider than that between gram and *dal*. It is mainly due to the fact that *baisin* is liable to adulteration; that its prices are more variable. *Choomi* and husk, which are by-products in the manufacture of gram *dal* are of local importance. Their prices follow the trend of gram *dal* prices fairly closely. There is little wholesale trade in parched gram. Nevertheless, prices of this product bear a close relation to gram prices.

### B.—Conclusions and recommendations.

(1) The average yield per acre of gram in India during the ten years ending 1939 was 503 lb. This is a low outturn and can be increased by growing high yielding varieties. Side by side with increase in yield, improvement in quality is also desirable. Certain high yielding and better quality varieties have been evolved by the Imperial Agricultural Research Institute, Pusa and the Punjab Agriculture Department. These should be popularised among the cultivators in suitable areas with a view to replacing indigenous poor yielding and inferior strains.

(2) Of the important provinces producing gram, the Punjab issues a First and a Final Forecast. It is desirable that similar forecasts may also be issued in the United Provinces, Bihar and the Central Provinces.

(3) As in the case of other commodities, the share of the producer in the consumer's rupee in the gram trade is low and as recommended in other survey reports, the remedy lies in the development of co-operative marketing of agricultural produce. It is suggested that co-operative sale of gram may be organised in the main producing areas.

(4) The merchandising charges on gram are exorbitant in several areas. In order to enable the producer to get a fair return, it is essential that market charges should be regulated and standardised.

(5) Efforts should be made to introduce a standard contract for trade in gram in India on the return of normal conditions after the War.

## APPENDIX I.

*Area (published) under gram in different provinces and States of India.*

(Thousand acres.)

Province or State.	1920-21.	1921-22.	1922-23.	1923-24.	1924-25.	1925-26.	1926-27
<i>British India—</i>							
United Provinces . . . . .	3,961	6,058	7,121	6,356	6,817	6,641	6,012
Punjab . . . . .	2,229	5,147	5,428	4,202	5,697	3,710	4,685
Bihar (a) . . . . .	1,408	1,481	1,541	1,427	1,436	1,412	1,422
Central Provinces . . . . .	899	899	1,104	1,188	1,120	1,277	1,140
Bombay (b) . . . . .	477	663	788	625	741	586	676
Sind . . . . .					Included	with	Bombay
North-West Frontier Province . .	144	269	221	228	227	228	207
Bengal . . . . .	162	142	141	130	130	136	126
Madras . . . . .	94	112	127	106	109	119	60
Other provinces . . . . .	27	120	99	64	140	53	93
Total British Provinces . . . . .	9,401	14,891	16,570	14,326	16,417	14,162	14,421
<i>Indian States—</i>							
Hyderabad . . . . .	558	809	759	842	835	821	853
Gwalior . . . . .	509	559	652	641	680	733	652
<i>Punjab States—</i>							
Patiala . . . . .	165	375	549	571	628	262	498
Bahawalpur . . . . .	103	175	206	192	223	173	199
Faridkot . . . . .	120	140	164	162	160	174	152
Other Punjab States . . . . .	65	315	434	277	593	256	425
Total Punjab States . . . . .	453	1,005	1,353	1,202	1,604	865	1,274
<i>Rajputana States—</i>							
Bharatpur . . . . .	18	204	210	199	273	57	245
Bikaner . . . . .	1	65	150	63	151	97	127
Other Rajputana States . . . . .	202	424	523	491	694	469	608
Total Rajputana States . . . . .	321	693	883	753	1,118	623	980
<i>Central India States—</i>							
Bhopal . . . . .	186	156	149	176	132	167	155
Indore . . . . .	81	60	88	120	92	112	115
Other Central India States . . . .	43	49	54	53	47	41	39
Total Central India States . . . .	310	265	291	349	271	320	309
Mysore . . . . .	Not available.	42	52	57	44	39	70
Other Indian States . . . . .	125	160	208	166	162	159	160
Total Indian States . . . . .	2,276	3,533	4,198	4,010	4,714	3,560	4,298
Total India . . . . .	11,677	18,424	20,768	18,336	21,131	17,722	18,719



APPENDIX I—*contd.**Area (published) under gram in different provinces and States of India—contd.*

(Thousand acres.)

Province or State	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.
<b>British India—</b>							
United Provinces . . . . .	5,931	5,424	4,207	5,102	5,686	5,398	5,300
Punjab . . . . .	4,089	4,160	3,151	4,122	5,547	3,894	6,586
Bihar (a) . . . . .	1,326	1,288	1,467	1,482	1,465	1,499	1,484
Central Provinces . . . . .	1,104	1,298	1,214	1,332	1,327	1,365	1,240
Bombay (b) . . . . .	740	774	727	876	1,019	981	1,085
Sind . . . . .							
North-West Frontier Province . . . . .	233	193	229	193	224	228	223
Bengal . . . . .	92	143	154	152	180	177	175
Madras . . . . .	74	74	75	85	195	90	102
Other Provinces . . . . .	166	59	31	46	134	97	141
Total British Provinces . . . . .	13,689	13,413	11,255	13,390	15,687	13,729	16,336
<b>Indian States—</b>							
Hyderabad . . . . .	687	736	1,106	1,051	1,236	1,231	1,282
Gwalior . . . . .	615	991	464	809	761	748	672
<b>Punjab States—</b>							
Patiala . . . . .	478	574	262	529	543	209	591
Bahawalpur . . . . .	181	199	215	270	222	237	335
Faridkot . . . . .	123	155	132	157	174	123	171
Other Punjab States . . . . .	464	390	129	328	399	271	634
Total Punjab States . . . . .	1,186	1,318	738	1,284	1,338	840	1,729
<b>Rajputana States—</b>							
Bharatpur . . . . .	161	272	17	99	204	123	239
Bikaner . . . . .	92	162	92	242	269	133	287
Other Rajputana States . . . . .	589	767	237	400	684	598	724
Total Rajputana States . . . . .	842	1,201	396	741	1,157	854	1,250
<b>Central India States—</b>							
Bhopal . . . . .	155	155	132	132	144	154	169
Indore . . . . .	124	142	73	94	148	155	127
Other Central India States . . . . .	55	91	73	89	99	111	98
Total Central India States . . . . .	334	388	278	315	391	420	394
Mysore . . . . .	53	47	53	50	48	44	43
Other Indian States . . . . .	199	203	176	168	149	136	142
Total Indian States . . . . .	3,916	4,884	3,211	4,418	5,080	4,273	5,512
Total India . . . . .	17,605	18,297	14,466	17,808	20,767	18,002	21,848

## APPENDIX I—concl.

*Area (published) under gram in different provinces and States of India—concl.*

(Thousand acres.)

Province or State.	1934-35.	1935-36.	1936-37.	1937-38.	1938-39.	1939-40.	1940-41.
<i>British India—</i>							
United Provinces . . . .	5,510	5,680	6,445	5,757	5,529	5,399	5,106
Punjab . . . . .	3,621	4,708	4,909	3,755	2,302	2,413	3,450
Bihar (a) . . . . .	1,457	1,346	1,374	1,366	1,346	1,454	1,452
Central Provinces . . . .	1,238	1,217	1,154	1,191	1,107	1,012	1,152
Bombay (b) . . . . .	1,022	690	640	674	595	517	585
Sind . . . . .		314	347	363	296	374	389
North-West Frontier Province.	220	223	229	142	95	109	138
Bengal . . . . .	207	183	242	279	342	310	319
Madras . . . . .	115	75	83	52	51	66	66
Other provinces . . . . .	81	118	109	83	20	37	51
Total British Provinces . .	13,471	14,554	15,532	13,662	11,683	11,690	12,700
<i>Indian States—</i>							
Hyderabad . . . . .	1,251	1,272	1,239	1,264	1,235	1,239	1,127
Gwalior . . . . .	709	693	692	691	650	651	671
<i>Punjab States—</i>							
Patiala . . . . .	354	612	519	533	206	214	469
Bahawalpur . . . . .	301	246	282	266	256	288	263
Faridkot . . . . .	143	141	132	129	116	89	119
Other Punjab States . . . .	224	482	348	343	161	129	224
Total Punjab States . . . .	1,022	1,481	1,281	1,271	739	720	1,075
<i>Rajputana States—</i>							
Bharatpur . . . . .	135	220	193	47	31	168	120
Bikaner . . . . .	184	236	249	220	214	168	259
Other Rajputana States . . .	597	742	704	540	225	312	354
Total Rajputana States . . .	916	1,198	1,146	807	464	2	729
<i>Central India States—</i>							
Bhopal . . . . .	169	172	172	188	177	177	177
Indore . . . . .	129	112	115	114	104	87	135
Other Central India States . .	101	94	93	90	89	87	93
Total Central India States . .	399	378	380	392	370*	351*	405*
Mysore . . . . .	45	54	38	38	35	33	39
Other Indian States . . . . .	153	149	158	174	133*	164*	129*
Total Indian States . . . . .	4,495	5,225	4,925	4,637	3,626	3,780	21,177
Total India . . . . .	17,956	19,779	20,457	18,299	15,309	15,470	16,877

Source.—Agricultural Statistics up to 1940-41 for British Provinces and up to 1937-38 for States respectively.

(a) Includes Orissa up to 1934-35.

(b) Includes Sind up to 1934-35.

\* Includes estimated figures for certain States.

## APPENDIX II.

Unreported gram area in certain States of India (acres).

Name of States.	1937-38.	1938-39.	1939-40.	1940-41.
<i>Central India States—</i>				
Panna . . . . .	67,645	59,875	52,135	57,018
Dhar . . . . .	26,573	24,838	24,975	31,511
Rewa . . . . .	91,801	105,536	96,280	72,923
Datia . . . . .	77,723	77,542	69,286	76,651
Jhabua . . . . .	34,681	25,807	14,608	36,859
Ajaigarh . . . . .	15,759	14,715	13,253	14,239
Other C. I. States . . . . .	240,741	233,214	208,199	136,740
Total C. I. States . . . . .	574,923	544,527	318,736	422,941
<i>Rajputana States—</i>				
Banswara . . . . .	32,426	30,743	12,373	45,285
Jodhpur . . . . .	73,100	17,665	13,685	92,930
Other Rajputana States . . . . .	62,608	53,686	50,534	63,597
Total Rajputana States . . . . .	168,134	102,094	76,592	201,812
<i>Deccan States—</i>				
Kolhapur . . . . .	24,549	25,341	26,707	18,249
Other Deccan States . . . . .	13,789	13,217	11,416	11,631
Total Deccan States . . . . .	38,338	38,558	38,123	29,880
<i>Gujrat and Western India States—</i>				
Baria . . . . .	26,288	2,361	33,419	6,326
Other Gujrat States . . . . .	37,657	31,192	14,555	27,611
Total Gujrat States . . . . .	63,945	33,553	47,974	33,937
<i>Total Eastern Agency States . . . . .</i>	<i>50,633</i>	<i>51,522</i>	<i>50,877</i>	<i>53,234</i>
GRAND TOTAL . . . . .	875,973	767,254	692,302	741,804

## APPENDIX III.

Irrigated and unirrigated area under gram in the Punjab, United Provinces and Bombay.

(In thousand acres).

Years.	Punjab.		United Provinces.		Bombay.	
	Irrigated.	Unirrigated.	Irrigated.	Unirrigated.	Irrigated.	Unirrigated.
1930-31 . . . . .	1,243	2,878	708	4,395	..	..
1931-32 . . . . .	1,383	4,164	683	5,003	..	..
1932-33 . . . . .	1,175	2,719	849	4,550	..	..
1933-34 . . . . .	1,244	5,342	718	4,582	..	..
1934-35 . . . . .	1,001	2,620	925	4,585	..	..
1935-36 . . . . .	1,006	3,701	927	4,753	..	..
1936-37 . . . . .	1,205	3,703	782	5,663	63	577
1937-38 . . . . .	1,038	2,716	1,131	4,626	59	615
1938-39 . . . . .	936	1,366	1,099	4,431	71	524
1939-40 . . . . .	990	1,423	1,024	4,375	63	454

Source.—Season and Crop Reports.

## APPENDIX IV.

*Production of gram in different provinces and States of India during the years 1935-36 to 1941-42.*  
(In thousand tons.)

Province or State.	1935-36.	1936-37.	1937-38.	1938-39.	1939-40.	1940-41.
<i>British India—</i>						
United Provinces . . . . .	1,718	1,917	1,643	1,481	1,678	1,560
Punjab . . . . .	954	953	640	375	499	700
Bihar . . . . .	382	450	453	415	459	468
Central Provinces . . . . .	231	209	223	185	196	197
Bombay . . . . .	112	87	95	91	78	96
Bengal . . . . .	47	68	72	97	84	76
Sind . . . . .	37	50	55	47	49	50
N.-W. F. P. . . . .	32	41	26	13	20	7
Madras . . . . .	15	14	10	11	14	14
Other Provinces . . . . .	23	28	21	5	8	12
Total Br. Provinces . . . . .	3,551	3,817	3,238	2,720	3,085	3,180
<i>Indian States—</i>						
Hyderabad . . . . .	207	196	199	195	198	165
Gwalior . . . . .	185	138	111	102	185	194
<i>Punjab States—</i>						
Patiala . . . . .	123	145	122	38	43	83
Behawalpur . . . . .	63*	72*	68	66	74	68
Faridkot . . . . .	43*	41*	39	35	29	36
Other Punjab States . . . . .	145*	104*	99	51	40	53
Total Punjab States . . . . .	374	362	328	190	186	240
<i>Rajputana States—</i>						
Bharatpur . . . . .	99	87	21	14	76	55
Bikaner . . . . .	96	101	89	87	68	105
Other Rajputana States . . . . .	178	145	130	41	88	93
Total Rajputana States . . . . .	373	333	240	142	232	253
<i>Central India States—</i>						
Bhopal . . . . .	25†	28†	26†	26†	26†	26†
Indore . . . . .	16†	17†	17†	15	13	21
Other C. I. States . . . . .	25*	25*	24	25	22	20
Total C. I. States . . . . .	66	70	67	66	61	67
Mysore . . . . .	9§	6§	6§	6§	4	4
Other Indian States . . . . .	31*	33*	40	33	39	31
Total Indian States . . . . .	1,245	1,138	991	734	905	954
GRAND TOTAL . . . . .	4,796	4,955	4,229	3,454	3,990	4,134

Note.—The production is based on the published acreage figures.

\* Calculated on the basis of the average yield of 1937-38 to 1938-39.

† Calculated on the basis of the average yield of 1938-39 and 1939-40.

‡ Based on the average yield of Indore for 1938-39 and 1939-40.

§ Based on the average yield of 1939-40 and 1940-41.

## APPENDIX V.

*Production of gram in unreported areas.*

(Tons)

Name of States.	1937-38.	1938-39.	1939-40.	1940-41.
<i>Rajputana States—</i>				
Banswara . . . . .	8,934	8,471	3,409	12,405
Jodhpur . . . . .	26,855	6,490	5,028	34,140
Other Rajputana States . . . . .	16,242	14,089	12,190	16,098
Total Rajputana States . . . . .	52,031	29,050	20,627	62,643
<i>Central India States—</i>				
Panna . . . . .	8,790	10,564	6,971	6,940
Dhar . . . . .	3,514	3,285	3,578	5,557
Rewa . . . . .	24,518	24,579	22,892	19,280
Datia . . . . .	21,415	21,365	19,091	21,120
Jhabua . . . . .	9,595	7,135	4,083	10,173
Ajaigarh . . . . .	2,895	2,703	1,927	2,016
Other C. I. States . . . . .	8,626	3,245	9,393	9,145
Total C. I. States . . . . .	76,353	72,876	67,935	74,231
<i>Deccan States—</i>				
Kolhapur . . . . .	4,509	4,655	4,906	3,352
Other Deccan States . . . . .	4,383	8,072	4,247	2,922
Total Deccan States . . . . .	8,892	12,727	9,153	6,274
<i>Gujrat and Western India States—</i>				
Baria . . . . .	4,829	434	6,139	1,162
Other States . . . . .	1,537	2,972	1,132	6,009
Total Gujrat and Western India States . . . . .	6,366	3,406	7,271	7,171
<i>Total Eastern States Agency . . . . .</i>	<i>9,526</i>	<i>6,199</i>	<i>4,928</i>	<i>4,981</i>
GRAND TOTAL . . . . .	153,168	124,258	109,914	155,246

## APPENDIX VI.

*Production of gram in different British provinces of India.*

(Thousand tons.)

Year.	United Provinces.	Punjab.	Bihar. (a).	Central Provinces and Berar.	Bombay (b).	Sind.	North-West Frontier Province.	Bengal.	Madras.	Others.	Total
1920-21 . . .	1,180	361	556	129	53	..	17	44	19	3	2,360
1921-22 . . .	2,114	1,143	649	193	114	..	46	32	22	20	4,330
1922-23 . . .	2,543	1,510	670	220	139	..	13	34	25	19	5,170
1923-24 . . .	2,307	1,116	541	282	90	..	42	29	24	11	4,440
1924-25 . . .	1,987	1,149	509	274	132	..	31	34	24	26	4,160
1925-26 . . .	2,070	760	529	285	97	..	40	32	26	10	3,840
1926-27 . . .	1,772	1,199	561	225	107	..	23	34	8	11	3,940
1927-28 . . .	1,501	858	430	178	136	..	27	18	15	16	3,170
1928-29 . . .	1,065	726	442	153	115	..	17	42	16	11	2,580
1929-30 . . .	1,247	763	533	219	119	..	34	46	16	3	2,980
1930-31 . . .	1,402	910	532	226	158	..	16	48	17	6	3,310
1931-32 . . .	1,560	1,080	503	250	188	..	27	56	22	8	3,690
1932-33 . . .	1,398	894	503	250	186	..	27	54	20	11	3,340
1933-34 . . .	1,276	1,385	492	202	121	46	20	52	22	49	3,660
1934-35 . . .	1,525	798	495	254	114	36	29	70	20	13	3,350
1935-36 . . .	1,718	954	382	231	112	37	32	47	15	23	3,540
1936-37 . . .	1,917	953	450	209	87	50	41	68	14	28	3,810
1937-38 . . .	1,643	640	453	123	95	55	26	72	10	21	3,230
1938-39 . . .	1,481	375	415	185	91	47	13	97	11	5	2,720
1939-40 . . .	1,678	499	459	196	78	49	20	84	14	8	3,080
1940-41 . . .	1,560	700	468	197	96	50	7	76	14	12	3,180

*Source.—Estimates of Area and Yield of Principal Crops in India.*

(a) Figures prior to 1936-37 relate to Bihar and Orissa.

(b) Figures prior to 1933-34 relate to Bombay and Sind.

## APPENDIX VII.

Classification according to colour of certain commercial types and descriptions of gram in the various provinces and States.  
(Please see pp. 9 to 12 of the Report.)

Province or State.	Predominantly white.	Predominantly pink or <i>gulabi</i> .	Predominantly yellow.	Yellow and brown (percentage of each colour from 40 to 60).	Predominantly brown.	Brown and dusky (percentage of each colour from 40 to 60).	Predominantly dusky.	Predominantly red.	Total.
1	2	3	4	5	6	7	8	9	10
United Provinces-- (a) No. of samples conforming to colour.	4 (including one sample of Punjab gram).	Nil.	Nil.	5	113 (including 3 of Punjab and 4 of Malwa samples).	15	12	4	153
(b) Trade descriptions.	Yellow deshi of Lakhimpur.	..	..	Yellow of Hardoi. Desi yellow of Bijnor. Desi red of Allahabad.	Products of all markets going by the names of desi, desi dara, desi yellow, desi red, etc., as well as Punjab and Malwa varieties.	As in the previous column, but excluding Punjab gram.	Khaggar gram, dark desi, desi black, as well as some desi dara and red.	Desi red of Benares, Rai Bareilly and Parbagarh. Desi yellow of Rai Bareilly.	..
Punjab-- (a) No. of samples conforming to colour.	3	Nil.	9	9	67	23	7	Nil.	118
(b) Trade descriptions.	Kabuli big and small.	..	Yellow gram of the Canal Colony, Ferozepore district and South-east Punjab as well as the Shahpur district.	As in previous column.	Types from the whole of the Punjab and known by the names of desi, mixed, dara, 49 G.B., 151 G.B., Chachrauli dara, Watni, Bhawla. Palra gram, Peela or yellow gram, etc.	As in previous column, but mainly from the North-Western districts like Mianwali, Hoshiarpur, etc.	Local varieties mainly from Mianwali and to some extent from Kamal, Jullundur and Amritsar markets.	..	..

APPENDIX VII—*contd.*Classification according to colour of certain commercial types and descriptions of gram in the various provinces and States—*contd.*

Province or State.	Predominantly white.	Predominantly pink or <i>gulabi</i> .	Predominantly yellow.	Yellow and brown (percentage of each colour from 40 to 60).	Predominantly brown.	Brown and dusky (percentage of each colour from 40 to 60).	Predominantly dusky.	Predominantly red.	Total.
1	2	3	4	5	6	7	8	9	10
<i>Bihar and Orissa—</i> (a) No. of samples conforming to colour. (b) Trade descriptions.	1	<i>Nil.</i>	<i>Nil.</i>	2	35	<i>Nil.</i>	1 (from Cuttack).	<i>Nil.</i>	39
	Kabuli big	..	..	Dalta nganj and chota dana, both from Patna.	Red and yellow types of <i>bara</i> and <i>chota</i> dana gram from various markets in the chief producing districts.	..	Inferior small from Cuttack.	..	..
<i>Central Provinces—</i> (a) No. of samples conforming to colour. (b) Trade descriptions.	..	*4	<i>Nil.</i>	1	20	1	3.	<i>Nil.</i>	29
	..	<i>Gulabi</i> (Saugor Dist.) D. 8. Improved.	..	Grai Sahad (Saugor Dist.).	Desi and Imalia chena, A. D. 3, A. D. 5, A. D. 6 and Pusa No. 28.	Desi (Saugor Dist.).	Desi (Saugor Dist.).	..	..
<i>Bombay—</i> (a) No. of samples conforming to colour. (b) Trade descriptions.	3	<i>Nil.</i>	2	1	13	2	<i>Nil.</i>	1	23
	Kare Kadli (Tharwar), Kabuli (Poona), Punjab Kabuli (Bombay).	..	Yellow (Dohad), Punjab Jam-busari (Bombay).	Desi (Sholapur).	Debhvari Kunch (Bijapur), Bombay Kadli, Javari Kadli (Dharwar), Punjab gram of Surat, Broach and Dhulia, Desi gram of Broach. Amol, Poona and Sholapur, Gardarwade (Lalsgaon), Bhul (Ahmedabad), etc.	Punjab gram.	..	Bhopal gram.	..



<b>Sind—</b> (a) No. of samples conforming to colour. (b) Trade descriptions.	7	Nil	1	Nil	1	Nil	1	Nil	10
	Amritsari Jarkachena (Karachi), Sindhi chena (Khairpur), white Jaohahad (Karachi), Thullachena (Nawabshah), Achachena (Karachi) and Sakhwachena (Sukkur). Only Amritsari is large sized.	..	Yellow (Karachi).	..	Karachi red.	..	Isakhani gram (Karachi).	..	Nil
<b>Bengal—</b> (a) No. of samples conforming to colour. (b) Trade descriptions.	†2	Nil	Nil	Nil	5	Nil	Nil	3	10
	Gram chola of Goteagon and Monghyr (Calcutta).	..	..	..	White (Calcutta), gram chola from Mokamel and Monghyr, and Patnai gram (Kishan Nagar).	..	..	Ballia and Mokameh (Nymensingh) and Patnai (Bhairah Bazar).	..
<b>Madras—</b> (a) No. of samples conforming to colour. (b) Trade descriptions.	2	Nil	2	Nil	Nil	Nil	Nil	8	12
	Punjab white (Madura).	..	Local or desi (Nandyal and Kurnool).	..	..	..	..	Karachi Red and Rangoon Red (Madura and Tinnevely), Desi (Kurnool and Bellari), Sirsa gram.	..

\* An examination of these samples reveals that the colour is more akin to whitish brown than to pink. But the samples have been classified under *gulabi* in accordance with the popular name.

† One of these, with origin as Goteagon, may probably refer to the so-called "Gulabi" of the Central Provinces.

**APPENDIX VII—conold.**  
*Classification according to colour of certain commercial types and descriptions of gram in the various provinces and States—conold.*

Province or State.	Predominantly white.	Predominantly pink or gulabi	Predominantly yellow.	Yellow and brown (percentage of each colour from 40 to 60).	Predominantly brown.	Brown and dusky (percentage of each colour from 40 to 60).	Predominantly dusky.	Predominantly red.	Total
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>
<b>Ajmer-Merwara—</b> (a) No. of samples conforming to colour. (b) Trade descriptions.	Nil	Nil	Nil	Nil	Nil	Nil	1	6	7
	..	..	..	..	..	..	Ajmer chena (Todgarh).	Desi, Marwari and Rabi gram from Ajmer and adjoining States of Rajputana.	..
<b>Hyderabad State—</b> (a) No. of samples conforming to colour. (b) Trade descriptions.	2	Nil	Nil	Nil	34	1	1	Nil	40*
	Kabuli (Jalna Dist.).	..	..	..	Peela, Lakhi, Medah Lakhi, Medah peela, and desi chana (Atrafehaida, Bidar, Jalna, Parbhani, Nanded and Warangal Dist.). Hoshangabad chena (Warranga).	Lal chena (Gulbarga).	Gulbarga chena.	..	..
<b>Mysore State—</b> (a) No. of samples conforming to colour. (b) Trade descriptions.	Nil	Nil	10	Nil	4	Nil	Nil	3	17
	..	..	Desi (Mysore)	..	Desi (Mysore).	..	..	Desi (Mysore).	..
<b>Patiala State—</b> (a) No. of samples conforming to colour. (b) Trade descriptions.	Nil	Nil	Nil	Nil	1	Nil	Nil	Nil	1
	..	..	..	..	Desi (Narwana Tahsil).	..	..	..	..
<b>Total</b>	<b>24</b>	<b>4</b>	<b>24</b>	<b>18</b>	<b>293</b>	<b>42</b>	<b>26</b>	<b>25</b>	<b>458</b>

\*Two samples of predominantly black or kala chena.

## APPENDIX VIII.

*Approximate retention by producers and marketable surplus of gram crop in different trade blocks of India.*

(In thousand tons.)

Trade Block.	Production 1936-37/ 1938-39.	Quantities retained by producers for					Market- able surplus.
		Seed.	Consumption.		Pay- ment of wages to labourers	Total.	
			As cattle feed.	For edible purposes.			
United Provinces . . . . .	1,702	161.7 (9.5)	170.2 (10.0)	510.6 (30.0)	340.4 (20.0)	1,182.9 (69.5)	519.1 (30.5)
Punjab . . . . .	949	83.5 (8.8)	237.3 (25.0)	165.1 (17.4)	19.0 (2.0)	504.9 (53.2)	444.1 (46.8)
Bihar . . . . .	439	37.8 (8.6)	52.2 (11.9)	259.0 (59.0)	2.2 (0.5)	351.2 (80.0)	87.8 (20.0)
Central Provinces . . . . .	206	20.6 (10.0)	7.6 (3.7)	59.5 (28.9)	15.3 (7.4)	103.0 (50.0)	103.0 (50.0)
Bombay . . . . .	113	10.1 (9.0)	2.6 (2.3)	20.9 (18.5)	5.6 (4.9)	39.2 (34.7)	73.8 (65.3)
Sind . . . . .	55	5.4 (10.0)	2.8 (5.0)	2.8 (5.0)	N	11.0 (20.0)	44.0 (80.0)
Bengal . . . . .	79	5.5 (7.0)	N	33.2 (42.0)	0.8 (1.0)	39.5 (50.0)	39.5 (50.0)
North-West Frontier Province . . . . .	27	2.7 (10.0)	1.1 (4.0)	0.3 (1.0)	0.3 (1.0)	4.4 (16.0)	22.6 (84.0)
Madras . . . . .	12	1.2 (10.0)	N	7.8 (65.0)	N	9.0 (75.0)	3.0 (25.0)
Delhi . . . . .	14	1.3 (9.0)	0.7 (5.0)	1.9 (13.5)	N	3.9 (27.5)	10.1 (72.5)
Orissa . . . . .	7	1.0 (14.3)	N	4.0 (57.1)	N	5.0 (71.4)	2.0 (28.6)
Assam . . . . .	1	N	N	N	N	N	1.0 (100.0)
H. E. H. the Nizam's Dominions . . . . .	197	23.6 (12.0)	N	2.0 (1.0)	2.0 (1.0)	27.6 (14.0)	169.4 (86.0)
Rajputana . . . . .	273	24.6 (9.0)	8.2 (3.0)	35.2 (12.9)	N	68.0 (24.9)	205.0 (75.1)
C. I. States . . . . .	258	21.9 (8.5)	19.4 (7.5)	23.7 (9.2)	N	65.0 (25.2)	193.0 (74.8)
Mysore . . . . .	6	N	N	N	N	N	6.0 (100.0)
Kashmir . . . . .	N	N	N	N	N	N	N
Total	4,338	400.9 (9.2)	502.1 (11.6)	1,126.0 (26.0)	385.6 (8.9)	2,414.6 (55.7)	1,923.4 (44.3)

Note.—Figures in brackets indicate percentages to total.

N.—Negligible.

## APPENDIX IX.

*Approximate average monthly arrivals of gram at certain important centres of production and consumption.*

(Hundred maunds.)

Months.	Punjab (a) (average 1936-37 to 1938-39).	United Provin- ces (b) ( average 1938-39 to 1941-42).	Central Provin- ces (c) (average 1934-35 to 1936-37).	Into chief ports by rail and river. (Average 1937-38 to 1939-40.)			
				Calcutta.	Bombay.	Karachi.	Madras.
April . . . .	105 (7·7)	598 (9·5)	144 (27·2)	1,710 (13·8)	1,150 (14·2)	2,228 (8·7)	2,295 (11·9)
May . . . .	420 (30·6)	922 (14·6)	73 (13·8)	1,161 (9·3)	911 (11·2)	6,509 (25·6)	1,872 (9·7)
June . . . .	405 (29·6)	570 (9·0)	23 (4·4)	975 (7·8)	328 (4·0)	4,803 (18·1)	1,262 (6·6)
July . . . .	204 (14·9)	273 (4·3)	17 (3·2)	733 (5·9)	308 (3·8)	2,199 (8·6)	1,529 (8·0)
August . . . .	40 (2·9)	297 (4·8)	6 (1·1)	809 (6·5)	465 (5·7)	1,135 (4·5)	1,570 (8·2)
September . . . .	36 (2·6)	386 (6·3)	5 (1·0)	895 (7·2)	714 (8·8)	1,111 (4·4)	2,105 (11·0)
October . . . .	50 (3·6)	482 (7·7)	9 (1·7)	1,204 (9·7)	506 (6·7)	769 (3·0)	1,527 (8·0)
November . . . .	24 (1·8)	632 (10·0)	20 (3·8)	1,242 (10·0)	836 (10·3)	1,535 (6·0)	1,136 (5·9)
December . . . .	18 (1·3)	660 (10·5)	24 (4·5)	684 (5·5)	625 (7·7)	1,774 (7·0)	1,783 (9·3)
January . . . .	21 (1·5)	427 (5·8)	16 (3·0)	949 (7·6)	473 (5·8)	1,422 (5·6)	1,101 (5·3)
February . . . .	16 (1·2)	643 (10·2)	37 (7·0)	721 (5·8)	558 (6·9)	990 (3·9)	1,435 (7·5)
March . . . .	31 (2·3)	400 (6·3)	155 (29·3)	1,358 (10·9)	1,256 (15·4)	1,174 (4·6)	1,567 (8·2)
Total . . . .	1,370 (100·0)	6,290 (100·0)	529 (100·0)	12,441 (100·0)	8,130 (100·0)	25,449 (100·0)	19,182 (100·0)

(a) Raman and Mianwali.

(b) Shahjahanpur, Hardoi, Mirzapur and Jhansi.

(c) Akola, Nagpur and Raipur.

Note.—Figures in brackets indicate percentages to total.

## APPENDIX X.

*Imports of gram into British India from foreign countries.*

(Tons.)

Year.	Imports from			Imported into		
	Burma.*	Other countries.	Total.	Bengal.	Madras.	Others.
1920-21 . . . . .	2,034	15	2,049	2	2,044	3
1921-22 . . . . .	5,499	250	5,749	109	5,393	247
1922-23 . . . . .	6,221	186	6,407	75	6,116	216
1923-24 . . . . .	8,002	49	8,051	67	7,866	118
1924-25 . . . . .	1,369	11	1,380	22	1,347	11
Average . . . . .	4,625	102	4,727	55	4,553	119
1925-26 . . . . .	1,350	3	1,353	3	1,305	45
1926-27 . . . . .	1,045	5	1,050	102	948	..
1927-28 . . . . .	14,216	39	14,255	2,833	11,419	3
1928-29 . . . . .	25,296	69	25,365	17,602	7,763	..
1929-30 . . . . .	16,707	70	16,777	4,225	12,466	86
Average . . . . .	11,723	37	11,760	4,953	6,780	27
1930-31 . . . . .	6,162	115	6,277	400	5,877	..
1931-32 . . . . .	19,951	16	19,967	5,817	14,145	6
1932-33 . . . . .	20,798	29	20,827	10,922	9,905	..
1933-34 . . . . .	7,671	37	7,708	1,562	6,027	119
1934-35 . . . . .	4,557	110	4,667	1,473	3,072	122
Average . . . . .	11,828	61	11,889	4,035	7,805	49
1935-36 . . . . .	23,535	111	23,646	4,491	18,856	299
1936-37 . . . . .	27,350	183	27,533	8,346	18,670	517
1937-38 . . . . .	8,746	47	8,793	2,047	5,757	999
1938-39 . . . . .	6,585	..	6,585	1,129	5,382	74
1939-40 . . . . .	19,324	320	19,644	5,929	13,179	536
Average . . . . .	17,108	132	17,240	4,388	12,369	483
1940-41† . . . . .	8,703	133	8,836	3,153	5,559	124
1941-42 . . . . .	..	..	..	..	..	..

Source.—Annual Statement of the Sea borne Trade of British India, Vol. I and Annual Statement of the Sea-borne Trade and Navigation of Burma.

\* Refers to exports from Burma to India upto 1936-37.

† Compiled from confidential publication.

## APPENDIX XI.

*Periodicity of imports of gram into India from Burma.*

Month.	1934-35.	1935-36.	1936-37.	Average.	Percentage to total.
April . . . . .	208	1,436	4,220	1,955	9.9
May . . . . .	905	1,279	2,826	1,670	8.5
June . . . . .	256	1,617	3,727	1,867	9.5
July . . . . .	585	2,774	4,404	2,588	13.1
August . . . . .	315	2,763	3,856	2,311	11.7
September . . . . .	200	2,113	2,425	1,579	8.0
October . . . . .	302	2,319	1,967	1,529	7.7
November . . . . .	62	1,646	1,510	1,075	5.4
December . . . . .	87	1,136	437	553	2.8
January . . . . .	120	1,213	683	672	3.4
February . . . . .	370	1,976	848	1,065	5.4
March . . . . .	1,191	4,213	3,240	2,881	14.6
Total . . . . .	4,601	24,485	30,143	19,743	100.0

Source.—Accounts relating to the Coasting Trade and Navigation of British India.

## APPENDIX XII.

## Exports of gram from British India to foreign countries:

Tons.

Year.	Exported to.							Exported from							
	United King- dom.	Burma.*	Ceylon.	Straits Settle- ment.	Mauritius and Dependen- cies.	Germany.	Nether- lands.	France.	Egypt.	Other countries.	Total.	Bengal.	Bombay.	Sind.	Madras.
1920-21	..	1,090	1,710	452	1,129	..	..	..	2	1,156	5,539	4,426	704	409	..
1921-22	..	2,806	1,073	458	112	..	..	..	..	893	5,343	4,525	642	176	..
1922-23	10,896	309	1,387	379	752	..	49	4,236	42	1,146	19,295	2,397	1,348	15,366	184
1923-24	27,168	149	2,888	286	1,324	1,448	20,479	10,456	3,567	1,375	69,340	9,705	4,784	54,718	133
1924-25	57,393	8,926	3,196	495	1,182	23,947	30,417	15,440	7,196	1,882	150,074	21,449	7,438	121,077	110
Average	19,092	2,656	2,051	414	900	5,099	10,189	6,026	2,161	1,330	49,918	8,501	2,983	38,349	85
1925-26	213	3,816	3,195	575	1,067	1,190	3,349	8,603	5,888	1,829	32,865	4,242	4,421	24,021	181
1926-27	..	500	2,562	518	563	..	..	1,139	5,888	1,698	12,868	665	3,106	8,904	193
1927-28	100	116	2,617	447	443	..	..	2,473	6,539	2,143	14,398	313	3,185	10,705	195
1928-29	201	17	2,514	394	277	1	..	1,609	4,571	1,810	11,394	190	3,445	7,631	128
1929-30	..	61	2,317	319	345	238	670	75	4,202	1,772	9,092	379	2,505	5,970	238
Average	103	902	2,641	451	539	238	670	2,780	5,949	1,850	16,123	1,158	3,332	11,446	187
1930-31	70	24	2,417	318	379	3	..	945	4,343	1,662	10,161	341	2,527	7,024	269
1931-32	..	39	2,625	358	281	..	..	6,168	3,109	1,464	14,044	225	2,283	11,031	505
1932-33	6,677	12	2,474	432	384	..	..	16,831	102	1,652	28,564	112	2,490	25,434	528
1933-34	397	54	2,037	432	168	4,764	..	18,216	..	1,399	27,467	190	2,105	25,010	162
1934-35	11,499	589	2,797	592	218	643	4,111	..	1	3,382	23,832	151	2,641	20,527	513
Average	3,729	144	2,470	426	286	1,082	822	8,432	1,511	1,912	50,814	204	2,409	17,805	396
1935-36	99	31	2,904	1,092	319	..	..	..	..	1,484	5,929	223	3,019	2,520	167
1936-37	1	10	2,179	777	227	..	..	16,672	..	1,949	21,815	169	2,746	18,805	95
1937-38	1,842	115	2,506	1,750	224	..	..	13,335	..	1,977	21,749	393	3,803	17,380	173
1938-39	3,168	110	2,811	1,807	202	..	..	7,023	..	2,041	17,171	349	4,316	12,320	186
1939-40	9	102	2,807	1,035	233	..	..	390	..	861	5,437	192	2,974	2,000	271
Average	1,024	75	2,641	1,292	241	..	..	7,484	..	1,663	14,420	265	3,372	10,605	178
1940-41†	..	..	3,745	1,085	63	..	..	..	..	794	5,687	157	3,586	1,764	180
1941-42†	..	N. a.	3,939	969	N. a.	N. a.	N. a.	N. a.	N. a.	1,042	5,960	126	3,582	1,555	697

Source.—Annual Statement of the Sea-borne Trade of British India Vol. I and Annual Statement of the Sea-borne Trade and Navigation of Burma.

\* Refers to imports into Burma from India upto 1936-37.

† Compiled from confidential publications.

N. a.—Not available.

## APPENDIX XIII.

*Periodicity of exports of gram to foreign countries from British India.*

Month.	1937-38.	1938-39.	1939-40.	Average.	Percentage to total.
April . . . . .	372	1,088	367	609	4.1
May . . . . .	764	2,275	646	1,228	8.3
June . . . . .	1,505	4,180	455	2,046	13.8
July . . . . .	1,397	3,481	631	1,836	12.4
August . . . . .	1,924	1,152	436	1,171	7.9
September . . . . .	3,405	999	461	1,622	11.0
October . . . . .	2,450	1,139	278	1,289	8.7
November . . . . .	1,607	626	442	892	6.0
December . . . . .	1,941	649	497	1,029	7.0
January . . . . .	3,451	606	397	1,485	10.1
February . . . . .	1,443	417	528	796	5.4
March . . . . .	1,490	559	299	783	5.3
Total	21,749	17,171	5,437	14,786	100.0

*Source.*—Accounts relating to the Sea-borne Trade and Navigation of British India.

## APPENDIX XIV.

Market demand for gram for various purposes.  
(In thousand tons.)

Trade Blocks.	Production (Average 1936-37 to 1938-39).	Quantity retained at the form.	Imports (Average 1927-38 to 1939-40).	Market demand. (1+3)-2.	For human consumption.				For Stock feeding.		For seed purposes.	Exports (Average 1937-38 to 1939-40)
					Boiled whole.	Ata.	Dal.	Baisin.	Parched.	Meal.	Whole.	
United Provinces .	1,702	1,183	8	527	2-0 (0-4)	75-0 (14-2)	175-0 (33-2)	75-0 (14-2)	30-0 (5-7)	143-0 (8-2)	27-0 (5-1)	96-0 (18-2)
Punjab . . .	949	505	9	453	1-0 (0-2)	100-0 (22-1)	130-0 (28-7)	45-0 (9-9)	13-0 (2-9)	40-0 (8-8)	16-0 (3-6)	108-0 (23-8)
Bihar . . .	439	351	10	98	N	3-0	27-0	7-0	14-0	13-0	3-0	30-0
Central Provinces .	206	103	5	108	11-0 (10-2)	3-0 (2-8)	27-5 (20-4)	71-1 (3-7)	14-3 (11-1)	13-3 (4-6)	3-1 (15-7)	30-6 (31-5)
Bombay . . .	113	39	77	151	5-0 (3-3)	N	40-0 (26-5)	54-0 (35-7)	30-0 (19-9)	4-0 (2-6)	6-0 (4-0)	11-0 (7-3)
Sind . . .	55	21	56	100	N	1-0	36-0	12-0	2-0	7-0	N	41-0
Bengal . . .	79	40	40	79	4-0 (5-1)	1-0 (1-0)	36-0 (36-0)	12-0 (12-0)	2-0 (2-0)	12-0 (7-0)	7-0	2-0
North-West Frontier Province.	27	4	6	29	N	5-1 (5-1)	43-0 (43-0)	5-1 (5-1)	15-2 (15-2)	15-2 (15-2)	8-8 (8-8)	2-5 (2-5)
Madras . . .	12	9	142	145	38-7 (26-7)	3-4 (3-4)	37-9 (37-9)	10-4 (10-4)	6-9 (6-9)	34-5 (34-5)	2-0 (2-0)	6-9 (6-9)
Delhi . . .	14	4	14	21	1-0 (4-2)	4-0 (16-7)	7-0 (29-1)	7-0 (29-1)	1-0 (4-2)	2-0 (8-3)	1-0 (4-2)	4-1 (4-1)
Orissa . . .	7	5	2	4	N	N	1-5	1-5	1-0	N	N	4-2 (4-2)
Assam . . .	1	N	3	4	0-1 (2-5)	0-1 (2-5)	37-5 (37-5)	37-5 (37-5)	25-0 (25-0)	0-1 (2-5)	N	N
Hyderabad . . .	197	28	4	173	9-0 (5-2)	8-0 (4-6)	57-5 (27-2)	25-0 (35-8)	8-0 (4-6)	16-0 (9-2)	3-0 (1-8)	17-0 (9-8)
Rajputana States .	273	68	5	210	5-0 (2-4)	20-0 (9-5)	71-0 (33-8)	62-0 (18-1)	20-0 (9-5)	12-0 (5-7)	0	30-0 (14-3)
Central India States .	258	65	1	194	5-0 (2-5)	20-0 (10-3)	60-0 (30-9)	40-0 (20-6)	22-0 (11-4)	20-0 (10-3)	4-0 (2-1)	22-0 (11-4)
Mysore . . .	6	N	15	21	N	N	3-0 (14-3)	2-0 (9-5)	2-0 (57-2)	2-0 (9-5)	N	2-0 (9-5)
Kashmir . . .	N	N	1	1	N	N	1-0 (100-0)	N	N	N	N	N
Total .	4,338	2,415	408	2,321	81-8 (3-5)	239-1 (10-3)	687-8 (28-8)	357-5 (15-4)	278-2 (12-0)	186-1 (8-1)	93-5 (4-0)	402-0 (17-3)

N—Negligible.

Note.—Figures in brackets indicate percentage to total market demand.



## APPENDIX XV.

*Production and prices of wheat and gram in the United Provinces, Punjab, Central Provinces, and Bihar from 1921-22 to 1939-40.*

(Production is in thousand tons ; Price is in rupees per standard maund ; and figures in brackets denote percentages based on lower prices of wheat or gram.)

Years.	All India Production.			UNITED PROVINCES.						PUNJAB.			
	Wheat.		Gram.	Wheat.		Gram.		Difference in wheat and gram (+) or (—) as.	Wheat.		Gram.		Difference in wheat and gram (+) or (—) as.
	Produc- tion.	Price.	Produc- tion.	Price.	Produc- tion.	Price.	Produc- tion.		Produc- tion.	Price.	Produc- tion.	Price.	
	Rs.	A.	Rs.	A.	Rs.	A.	Rs.	A.	Rs.	A.	Rs.	A.	
1921-22	6,706	4,333	2,699	6	6	5	0	+22 (28)	4,185	5	1,143	5	+8 (10)
1922-23	9,830	5,173	2,587	4	9	2	13	+28 (62)	3,808	3	1,510	2	+16 (38)
1923-24	9,974	4,442	2,656	4	0	2	5	+27 (73)	4,019	3	1,116	2	+12 (26)
1924-25	9,660	4,166	2,447	5	11	1,987	3	+35 (63)	2,981	5	1,149	3	+22 (38)
1925-26	8,866	3,849	2,314	5	8	2,070	3	+27 (45)	3,382	4	760	4	+13 (21)
1926-27	8,696	3,940	2,514	5	3	1,772	4	+18 (28)	3,431	4	1,199	3	+12 (20)
1927-28	8,973	3,179	2,394	5	2	1,501	4	+14 (21)	2,764	4	858	3	+7 (11)
1928-29	7,791	2,657	2,500	5	5	1,065	5	Nil.	3,423	4	726	4	—7 (10)
1929-30	8,592	2,980	3,342	3	14	1,247	3	Nil.	4,208	3	763	3	—10 (20)
1930-31	10,469	3,400	2,726	2	5	1,402	2	+2 (6)	3,122	1	910	1	—5 (20)
1931-32	9,306	3,766	2,633	2	9	1,560	2	+8 (24)	3,152	2	1,080	1	+3 (9)
1932-33	9,024	3,439	2,744	2	15	1,398	2	+8 (21)	3,255	2	894	2	+7 (16)
1933-34	9,455	3,737	2,572	2	9	1,776	2	+4 (11)	3,253	2	1,385	2	+6 (18)
1934-35	9,424	3,629	2,554	2	13	1,525	2	+9 (25)	3,498	2	798	1	+4 (12)
1935-36	9,725	3,840	2,529	2	14	1,718	2	+14 (44)	3,496	2	954	2	+5 (14)
1936-37	9,752	4,115	2,803	3	10	1,917	2	+20 (53)	3,963	2	953	2	+8 (17)
1937-38	10,764	3,525	2,810	2	14	1,643	2	+10 (28)	4,220	2	640	2	—6 (15)
1938-39	9,963	3,002	2,715	2	15	1,481	2	Nil.	3,677	2	375	3	—16 (49)
1939-40	10,752	3,294	3,204	3	13	1,678	3	+10 (20)	4,263	2	499	3	—10 (21)
1940-41	..	..	..	3	8	..	3	..	..	..	..	..	..

# APPENDIX XV—*contd.*

*Production and prices of wheat and gram in the United Provinces, Punjab, Central Provinces and Bihar from 1921-22 to 1939-40.*

(Production is in thousand tons; Price is in rupees per standard maund; and figures in brackets denote percentages based on lower prices of wheat or gram.)

Years.	CENTRAL PROVINCES.				Difference in wheat and gram (+) or (—) as.	BIHAR.*				Difference in wheat and gram (+) or (—) as.
	Wheat.		Gram.			Wheat.		Gram.		
	Production.	Price.	Production.	Price.		Production.	Price.	Production.	Price.	
1921-22	698	7 4	193	Rs. A. 5 15	+21 (22)	1,133	7 7	649	Rs. A. 5 14	+25 (27)
1922-23	1,059	4 6	220	3 3	+19 (38)	1,266	5 13	670	4 2	+27 (41)
1923-24	839	4 2	282	3 0	+18 (38)	1,226	5 2	541	3 8	+26 (46)
1924-25	1,090	5 9	274	3 15	+26 (41)	1,175	6 6	509	4 3	+35 (52)
1925-26	907	4 14	285	3 14	+16 (26)	1,163	6 6	529	4 7	+31 (44)
1926-27	790	5 10	225	4 9	+17 (23)	1,186	6 5	561	5 0	+21 (26)
1927-28	619	5 3	178	4 5	+14 (20)	1,199	6 0	430	4 15	+17 (22)
1928-29	541	5 7	153	5 2	+5 (6)	1,212	6 0	442	5 8	+8 (9)
1929-30	617	4 7	219	4 3	+4 (5)	1,200	5 0	533	5 0	..
1930-31	641	2 4	226	2 4	Nil.	1,213	3 9	532	3 0	+9 (19)
1931-32	693	2 8	250	2 2	+6 (17)	1,221	3 8	503	2 12	+12 (27)
1932-33	670	2 14	250	2 6	+8 (21)	1,235	3 8	503	2 14	+10 (22)
1933-34	735	2 9	202	2 8	+1 (3)	1,222	3 3	492	2 8	+11 (28)
1934-35	780	2 8	254	2 6	+2 (5)	1,191	3 6	495	2 12	+10 (29)
1935-36	651	2 15	231	2 8	+7 (18)	1,142	3 7	382	2 9	+14 (34)
1936-37	612	3 14	209	3 0	+14 (30)	1,129	4 2	450	3 1	+17 (35)
1937-38	686	3 2	223	2 12	+6 (13)	1,098	3 15	453	2 12	+19 (56)
1938-39	686	2 15	185	3 0	-1 (2)	1,093	3 11	415	3 6	+21 (38)
1939-40	631	3 11	196	3 10	+1 (2)	1,138	4 3	459	3 12	+7 (12)
1940-41	..	3 12	..	3 5	..	..	4 7	..	3 8	..

\*Figures up to 1935-36 relate to Bihar and Orissa.

## APPENDIX XVI.

*Food values\* of wheat and gram.*

	Wheat.	Gram.
Moisture per cent. . . . .	12.77	9.83
Protein per cent. . . . .	11.77	17.08
Fat (Ether Extractives) per cent. . . . .	1.45	5.26
Mineral matter per cent. . . . .	1.49	2.68
Fibre per cent. . . . .	1.20	3.92
Carbohydrate per cent. . . . .	71.30	61.23
Calcium per cent. . . . .	0.054	0.165
Phosphorus per cent. . . . .	0.315	0.236
Iron mgs. per cent. . . . .	5.34	9.83
Calorific value per 100 gms. . . . .	345.4	360.6
Carotene (Internal Vitamin A units per 100 gms.) . . . .	108	316
Vitamin B1 (Internal units per 100 gms.) . . . .	230	93.0
Vitamin B2 . . . . .	+	+2
Vitamin C mgs. per 100 gms. . . . .	—	—

\* Source.—The Nutritive Value of Indian Foods and the Planning of Satisfactory Diets—Health Bulletin No. 23, pages 20-23.

## APPENDIX XVII.

*Comparative trade and official prices of gram at Agra (U. P.)*  
(Per maund.)

Month.	1935.						1936.					
	Trade.		Official.		Difference (Trade— Official).		Trade.		Official.		Difference (Trade— Official).	
	Rs	A. P.	Rs	A. P.	Rs.	A. P.	Rs.	A. P.	Rs.	A. P.	Rs.	A. P.
January . . . . .	2	0 0	1	15 10	(+)	0 0 2	2	0 5	2	0 11	(—)	0 0 6
February . . . . .	1	15 6	1	15 3	(+)	0 0 3	1	13 1	1	13 11	(—)	0 0 10
March . . . . .	1	11 3	1	11 4	(—)	0 0 1	1	15 2	2	0 5	(—)	0 1 3
April . . . . .	1	13 4	1	14 8	(—)	0 1 4	1	14 2	1	14 8	(—)	0 0 6
May . . . . .	1	15 6	2	0 6	(—)	0 1 0	1	14 3	1	14 5	(—)	0 0 2
June . . . . .	2	2 0	2	2 4	(—)	0 0 4	1	15 10	2	0 10	(—)	0 1 0
July . . . . .	2	2 7	2	2 8	(—)	0 0 1	2	1 0	2	1 7	(—)	0 0 7
August . . . . .	2	3 11	2	4 1	(—)	0 0 2	2	1 0	2	1 8	(—)	0 0 8
September . . . . .	2	3 6	2	3 11	(—)	0 0 5	2	0 0	1	15 3	(+)	0 0 9
October . . . . .	2	2 4	2	2 4	..		1	15 10	2	1 2	(—)	0 1 4
November . . . . .	2	2 10	2	2 5	(+)	0 0 5	1	15 0	2	2 10	(—)	0 3 10
December . . . . .	2	1 9	2	1 10	(—)	0 0 1	2	1 0	2	1 11	(—)	0 0 11
Average . . . . .	2	0 10	2	1 1	(—)	0 0 3	1	15 7	2	0 6	(—)	0 0 11

## APPENDIX XVIII.

*Comparative wholesale prices of Imalia, Peela and Gulabi varieties of gram at the Gadawara Market (C. P.).*  
(Per maund).

Month.	1937.					1938.				
	Imalia.	Peela.	Gulabi.	Premium over Imalia.		Imalia.	Peela.	Gulabi.	Premium over Imalia.	
				On Peela.	On Gulabi.				On Peela.	On Gulabi.
	Rs. A.	Rs. A.	Rs. A.	A.	Rs. A.	Rs. A.	Rs. A.	Rs. A.	Rs. A.	Rs. A. P.
January .	2 6	2 10	4 8	4	2 2	2 10	3 0	4 0	6 0	1 6 0
February .	2 6	2 10	4 8	4	2 2	2 5	2 9	3 9	4 0	1 4 0
March .	2 4	2 6	3 10	2	1 6	2 4	2 8	3 8	4 0	1 4 0
April .	2 10	2 14	3 11	4	1 1	2 4	2 8	3 8	4 0	1 4 0
May .	2 12	3 0	2 12	4	1 0	2 6	2 12	3 8	6 0	1 2 0
June .	2 12	3 0	3 12	4	1 0	2 8	2 12	3 8	4 0	1 0 0
July .	2 12	3 0	3 12	4	1 0	2 8	2 12	3 8	4 0	1 0 0
August .	2 12	3 0	3 12	4	1 0	2 8	2 12	3 8	4 0	1 0 0
September .	2 12	3 0	3 12	4	1 0	2 9	2 13	3 8	4 0	0 15 0
October .	2 12	3 0	3 13	4	1 1	2 12	3 0	3 8	4 0	0 12 0
November .	2 12	3 0	4 0	4	1 4	2 12	3 0	3 8	4 0	0 12 0
December .	2 10	3 0	4 0	6	1 6	2 13	3 1	3 8	4 0	0 11 0
Average .	2 10	2 14	3 14 6	4	1 4 6	2 8 3	2 12 7	3 8 9	0 4 4	1 0 6



# APPENDIX XIX.

Wholesale average monthly prices of different qualities of gram at Bombay.  
(Per maund.)

Month.	1935.			1936.			1937.			1938.			1939.		
	Peela.	Red.	Cawnpore.	Peela.	Red.	Cawnpore.	Peela.	Red.	Cawnpore.	Peela.	Red.	Cawnpore.	Peela.	Red.	Cawnpore.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
January.	2 14 4	2 11 11	2 12 10	3 1 2	2 12 4	2 10 8	3 6 0	3 1 5	3 1 10	3 7 9	3 2 6	3 0 9	3 14 3	3 12 1	3 9 11
February	3 0 9	2 13 1	2 13 3	2 13 3	2 9 2	2 9 4	3 2 6	2 14 4	2 15 11	3 6 0	3 0 4	2 14 7	3 12 11	3 11 3	3 10 4
March	2 13 9	2 11 4	2 10 8	2 12 5	2 9 10	2 9 4	3 3 2	2 14 7	2 14 10	3 1 8	2 15 0	2 11 6	3 7 9	3 5 7	3 6 10
April	2 12 5	2 9 10	2 10 0	2 13 3	2 8 9	2 7 2	3 5 1	3 1 5	3 1 8	2 15 11	2 14 2	2 13 3	3 10 4	3 8 10	3 7 4
May	2 12 3	2 10 8	2 11 6	2 12 10	2 8 11	2 8 6	3 3 10	3 0 6	3 0 9	3 1 2	2 15 3	2 14 2	3 12 1	3 10 7	3 8 10
June	2 10 8	2 10 0	2 10 5	2 12 10	2 9 7	2 8 8	3 4 3	3 0 9	3 1 8	3 0 9	2 15 0	2 14 2	3 12 1	3 10 9	3 8 10
July	2 11 6	2 8 4	2 9 4	2 13 9	2 10 8	2 10 0	3 6 10	3 0 9	3 1 5	3 4 3	3 2 5	3 2 9	3 13 7	3 10 4	3 7 11
August	2 12 5	2 9 10	2 10 7	3 0 1	2 13 6	2 13 3	3 7 3	3 3 4	3 2 11	3 4 6	3 0 4	3 0 4	3 14 3	3 12 1	3 10 9
September	2 12 5	2 10 8	2 10 8	3 0 9	2 13 3	2 10 5	3 7 9	3 2 6	3 2 11	3 7 9	3 1 0	3 0 9	4 5 8	4 0 5	3 14 3
October	2 15 3	2 13 1	2 12 5	2 15 8	2 11 9	2 10 3	3 6 10	3 1 8	3 1 8	3 13 10	3 7 4	3 7 4	4 6 6	4 3 1	4 2 2
November	3 0 9	2 13 3	2 15 0	3 1 5	2 12 8	2 10 11	3 4 3	3 1 8	3 0 4	3 8 7	3 8 2	3 7 1	4 7 0	4 3 1	4 2 2
December	3 0 9	2 12 2	2 10 11	3 3 4	2 12 0	2 11 4	3 7 9	3 2 6	3 1 8	3 13 10	3 9 11	3 8 3	5 5 4	4 14 10	4 11 8
Average	2 13 9	2 11 2	2 11 6	2 15 1	2 11 0	2 10 0	3 5 6	3 1 1	3 1 4	3 5 10	3 2 3	3 1 3	4 0 10	3 13 11	3 12 5

## APPENDIX XX.

*Wholesale average monthly prices of different qualities of gram at Karachi.*

(Per maund.)

Month.	1935.		1936.		1937.		1938.		1939.	
	White.	Yellow.	White.	Yellow.	White.	Yellow.	White.	Yellow.	White.	Yellow.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
January . . . . .	2 11 11	2 9 5	2 10 8	2 7 4	2 15 8	2 13 11	3 2 8	2 15 3	4 1 9	3 14 11
February . . . . .	2 11 0	2 7 11	2 10 2	2 7 5	3 3 2	2 13 4	3 1 6	2 13 9	4 6 1	3 14 4
March . . . . .	2 10 0	2 7 0	2 10 8	2 7 11	3 1 6	2 13 0	2 14 9	2 9 7	4 6 6	3 11 5
April . . . . .	2 8 9	2 7 11	2 10 1	2 7 11	3 1 6	2 15 2	2 14 11	2 13 1	3 15 6	3 11 2
May . . . . .	2 9 4	2 8 1	2 9 6	2 6 11	2 15 10	2 14 7	2 14 10	2 12 0	3 12 10	3 12 10
June . . . . .	2 7 11	2 6 5	2 8 0	2 7 1	2 15 10	2 14 4	2 15 0	2 12 8	3 11 3	3 9 8
July . . . . .	2 8 8	2 6 6	2 8 6	2 7 11	3 0 2	2 14 11	3 2 10	3 0 3	3 10 4	3 9 4
August . . . . .	2 8 6	2 5 10	2 10 3	2 8 1	3 1 1	2 14 4	3 2 10	2 14 3	3 3 6	3 10 0
September . . . . .	2 9 0	2 5 11	2 9 7	2 7 5	3 2 9	2 14 9	3 5 3	3 5 9	4 2 4	4 0 8
October . . . . .	2 2 6	2 9 2	2 13 11	2 9 10	3 1 6	2 13 8	3 6 1	3 5 9	4 2 8	4 2 4
November . . . . .	2 10 0	2 6 4	2 14 4	2 9 8	3 0 7	2 14 3	3 8 9	3 8 2	4 10 4	4 10 5
December . . . . .	2 8 10	2 6 5	3 1 3	2 12 0	3 0 10	2 14 0	3 15 4	3 12 2	4 12 4	4 12 5
Average . . . . .	2 8 10	2 7 3	2 11 1	2 8 3	3 1 0	3 2 4	3 3 5	2 15 7	4 1 3	3 15 3

## APPENDIX XXI.

*Average monthly wholesale prices of gram at Madras.*

(Per maund.)

Month.	1939.		1940.		1941.	
	Rangoon.	Punjab.	Rangoon.	Punjab.	Rangoon.	Punjab.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
January . . . . .	3 15 7	4 9 3	5 0 6	5 9 9	..	4 4 0
February . . . . .	4 0 3	4 9 6	4 12 11	5 1 9	..	4 2 6
March . . . . .	3 13 11	4 7 0	4 11 7	4 12 0	3 15 8	4 1 6
April . . . . .	3 11 10	4 8 6	4 9 0	4 13 3	3 14 9	4 0 0
May . . . . .	3 12 11	4 6 9	4 9 0	4 14 3	3 5 0	3 12 3
June . . . . .	3 14 10	4 7 2	Na	4 9 8	4 5 0	4 8 6
July . . . . .	3 13 10	4 4 9	Na	4 7 9	4 3 0	4 10 9
August . . . . .	3 14 0	4 4 3	Na	4 9 3	Na	4 7 3
September . . . . .	4 3 0	4 11 10	Na	4 8 6	4 3 0	4 12 3
October . . . . .	4 7 0	4 14 6	Na	4 9 6	4 6 6	4 8 9
November . . . . .	4 8 0	4 15 2	Na	Na	Na	4 14 9
December . . . . .	5 0 1	5 10 4	Na	Na	5 3 9	5 7 6
Average . . . . .	4 1 7	4 10 5	4 11 10*	5 0 7*	4 3 1†	4 7 8†

\* Average January—May 1940.

† Average March—July, September, October &amp; December 1941.

Na—Not available.

## APPENDIX XXII.

Average monthly wholesale prices of gram at certain important markets.

(Per maund.)

Markets.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.		Average.	
	Rs.	A. P.	Rs.	A. P.	Rs.	A. P.	Rs.	A. P.	Rs.	A. P.	Rs.	A. P.	Rs.	A. P.	Rs.	A. P.	Rs.	A. P.	Rs.	A. P.	Rs.	A. P.	Rs.	A. P.	Rs.	A. P.
1935—																										
Abohar	1 12	0	1 9	6	1 8	0	1 10	3	1 10	6	1 10	0	1 11	0	1 10	3	1 10	3	1 12	3	1 10	3	1 11	5	1 10	6
Hapur	1 13	10	1 13	2	1 14	5	1 12	5	1 13	11	2 0	3	2 1	9	2 0	0	2 0	4	2 1	7	2 0	6	1 15	1	1 15	3
Karachi	2 9	5	2 7	11	2 7	0	2 7	11	2 8	1	2 6	5	2 6	6	2 5	11	2 5	11	2 9	2	2 6	4	2 6	5	2 7	3
Bombay	2 11	11	2 13	1	2 11	4	2 9	10	2 10	8	2 10	8	2 8	4	2 9	10	2 10	8	2 13	1	2 13	3	2 12	2	2 11	2
Calcutta	2 15	6	3 1	0	2 11	6	2 10	6	2 11	6	2 12	6	2 12	3	2 11	9	2 11	6	2 13	6	2 13	6	2 14	0	2 12	11
1936—																										
Abohar	1 10	9	1 10	6	1 11	6	1 10	0	1 10	0	1 11	6	1 11	6	1 13	0	1 12	6	1 14	0	1 13	6	1 15	0	1 12	0
Hapur	1 13	8	1 13	0	1 13	7	1 15	9	1 13	6	1 14	5	1 15	11	2 0	10	2 0	5	2 0	4	1 15	7	2 2	4	1 15	3
Karachi	2 7	4	2 7	5	2 7	11	2 7	11	2 6	11	2 7	1	2 7	11	2 8	1	2 7	5	2 9	10	2 9	8	2 12	0	2 8	3
Bombay	2 12	4	2 9	2	2 9	10	2 8	9	2 8	11	2 9	7	2 10	8	2 13	6	2 13	3	2 11	9	2 12	8	2 12	0	2 11	0
Calcutta	2 13	6	2 12	9	2 13	0	2 9	6	2 11	3	2 10	0	2 10	6	2 12	0	2 10	6	2 12	0	2 14	0	2 14	6	2 11	11
1937—																										
Abohar	2 3	6	1 13	9	1 14	6	2 2	2	2 2	0	2 1	3	2 4	6	2 2	3	2 4	9	2 2	9	2 2	0	2 3	0	2 2	2
Hapur	2 4	6	2 1	3	2 1	6	2 3	9	2 5	3	2 3	8	2 5	10	2 6	3	2 5	8	2 6	3	2 5	8	2 3	3	2 4	5
Karachi	2 13	11	2 13	4	2 13	0	2 15	2	2 14	7	2 14	4	2 14	11	2 14	4	2 14	9	2 13	8	2 14	3	2 14	0	2 14	2
Bombay	3 1	5	2 14	4	2 14	7	3 1	5	3 0	6	3 0	9	3 0	9	3 3	4	3 2	6	3 1	8	3 1	8	3 2	6	3 1	1
Calcutta	3 4	0	3 4	0	3 6	0	3 3	6	3 3	0	2 14	6	3 1	6	2 14	0	3 1	0	2 14	0	2 15	0	2 14	0	3 1	2
1938—																										
Abohar	2 2	0	2 2	0	1 13	6	1 14	3	1 15	6	2 2	3	2 5	3	2 6	3	2 10	0	2 11	9	2 11	6	3 2	6	2 5	5
Hapur	2 4	10	2 2	0	2 0	10	2 4	4	2 5	3	2 3	7	2 7	10	2 7	5	2 8	10	2 12	1	2 8	9	3 1	1	2 7	0
Karachi	2 15	3	2 13	9	2 9	7	2 13	1	2 12	0	2 12	8	3 0	3	2 14	3	3 5	9	3 5	9	3 8	2	3 12	2	3 0	11
Bombay	3 2	6	3 0	4	2 15	0	2 14	2	2 15	3	2 15	0	3 2	5	3 0	4	4 2	9	3 7	4	3 8	2	3 9	11	3 2	3
Calcutta	3 15	0	4 0	6	3 11	8	3 10	0	3 11	0	3 11	2	3 10	0	3 12	0	4 2	9	4 2	8	4 10	6	5 0	0	4 0	1
1939—																										
Abohar	3 4	0	3 0	2	2 15	0	2 14	9	3 0	8	2 14	6	2 13	0	3 0	3	3 5	6	3 5	6	3 12	9	4 0	6	3 3	3
Hapur	3 1	8	2 14	6	2 14	9	2 13	1	3 0	7	2 14	3	2 12	6	2 15	11	3 6	4	3 7	1	3 10	11	4 2	5	3 2	10
Karachi	3 14	4	3 14	4	3 11	5	3 11	2	3 12	10	3 9	8	3 9	4	3 10	0	4 0	8	4 2	4	4 10	5	4 12	5	3 15	3
Bombay	3 12	1	3 11	3	3 5	7	3 8	10	3 10	7	3 10	9	3 10	4	3 12	1	4 0	5	4 3	1	4 3	1	4 14	10	3 13	11
Calcutta	3 15	0	4 0	6	3 11	8	3 10	0	3 11	0	3 11	2	3 10	0	3 12	0	4 2	9	4 2	8	4 10	6	5 0	0	4 0	1



# APPENDIX XXXIII.

Ready (pit) and "futures" prices of grain at Hapur for the period 1935-39.  
(Per maund.)

Month.	1935.			1936.			1937.			1938.			1939.		
	Ready.	Jeth*.	Bhadon†.	Ready.	Jeth*.	Bhadon†.	Ready.	Jeth*.	Bhadon†.	Ready.	Jeth*.	Bhadon†.	Ready.	Jeth*.	Bhadon†.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
January .	1 13 10	2 5 0	..	1 13 8	..	..	2 4 4	2 5 2	..	2 4 10	2 3 11	..	3 1 8	3 3 7	..
February .	1 13 1	2 0 9	..	1 13 1	..	..	2 1 1	2 3 10	..	2 2 0	2 1 4	..	2 14 7	3 0 9	..
March .	1 11 5	2 0 2	..	1 13 8	1 15 0	..	2 1 6	2 3 1	..	2 0 10	2 0 4	..	2 14 9	2 15 5	..
April .	1 12 5	2 0 9	2 1 9	1 13 8	1 14 7	1 14 6	2 3 4	2 4 11	2 4 3	2 4 4	2 2 11	2 3 8	2 13 1	2 14 3	2 14 4
May .	1 14 5	2 1 8	2 1 6	1 13 6	1 13 6	1 14 1	2 5 2	2 4 3	2 5 1	2 5 3	2 5 3	2 5 4	3 0 0	3 0 6	3 1 2
June .	2 0 3	..	2 0 8	1 14 4	..	1 15 0	2 3 9	..	2 4 4	2 4 7	..	2 4 9	2 14 4	..	2 14 4
July .	2 1 4	..	2 1 9	1 15 11	..	2 0 1	2 5 11	..	2 6 3	2 7 9	..	2 7 10	2 12 6	..	2 11 9
August .	2 0 1	..	2 0 1	2 0 8	..	2 1 8	2 6 3	..	2 6 4	2 7 8	..	2 7 5	2 15 7	..	2 14 10
September .	2 0 5	..	..	2 0 5	..	..	2 5 8	..	..	2 8 10	..	..	3 4 7	3 1 0	..
October .	2 1 7	..	..	2 0 4	..	..	2 3 0	2 4 5	..	2 12 1	2 8 11	..	3 7 1	3 4 0	..
November .	2 0 6	..	..	1 15 9	..	..	2 3 7	2 3 8	..	2 10 10	2 9 9	2 10 7	3 10 2	3 8 8	..
December .	1 15 1	..	..	2 2 4	2 2 2	..	2 3 3	2 3 11	..	3 1 0	2 15 11	..	4 2 2	4 2 9	..

\*May-June.

†August-September.

# APPENDIX XXIV.

Ready (pit) and "futures" prices of gram at Karachi for the period 1935-39.  
(Per maund.)

Month	1935.			1936.			1937.			1938.			1939.		
	Ready.	July.	Septem-ber.	Ready.	July.	Septem-ber.	Ready.	July.	Septem-ber.	Ready.	July.	Septem-ber.	Ready.	July.	Septem-ber.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
January .	2 9 5	2 13 11	..	2 7 4	2 8 5	..	2 13 11	2 12 11	..	2 15 3	2 11 9	..	3 14 4	3 7 11	..
February .	2 7 11	2 9 9	..	2 7 5	2 6 10	..	2 13 4	2 11 2	..	2 13 9	2 9 6	..	3 14 4	3 10 5	..
March .	2 7 0	2 8 0	..	2 7 11	2 6 5	2 8 1	2 13 0	2 11 11	..	2 9 7	2 7 10	..	3 11 5	3 3 11	..
April .	2 7 11	2 8 11	..	2 7 11	2 6 6	2 7 2	2 15 2	2 14 5	2 15 7	2 13 1	2 9 9	..	3 11 2	3 5 3	..
May .	2 8 1	2 7 8	2 9 2	2 6 11	2 5 9	2 6 10	2 14 7	2 13 5	2 14 5	2 12 0	2 10 6	2 11 2	3 12 10	3 6 3	3 7 6
June .	2 6 5	2 6 2	2 7 10	2 7 1	2 6 4	2 7 3	2 14 4	2 13 1	2 13 11	2 12 8	2 11 1	2 11 8	2 9 8	3 8 8	3 8 11
July .	2 6 6	..	2 7 4	2 7 11	..	2 8 1	2 14 11	..	2 14 8	3 0 3	..	2 14 6	3 9 4	..	3 7 10
August .	2 5 10	..	2 6 0	2 8 1	..	2 8 3	2 14 4	..	2 14 2	2 14 3	..	3 1 11	3 10 0	..	3 9 10
September .	2 5 11	2 8 11	2 5 11	2 7 5	2 9 7	..	2 14 9	..	..	3 5 9	2 13 7	..	4 0 8	3 10 0	..
October .	2 9 2	2 11 2	..	2 9 10	2 10 6	..	2 13 8	2 13 3	..	3 5 9	2 14 9	..	4 2 4	3 13 1	..
November .	2 6 4	2 9 10	..	2 9 8	2 10 9	..	2 14 3	2 12 4	..	3 8 2	3 6 7	..	4 10 5	4 6 5	..
December .	2 6 5	2 8 9	..	2 12 0	2 12 2	..	2 14 0	2 11 7	..	3 12 2	3 5 3	..	4 12 5	4 11 11	..

# APPENDIX XXV.

*Approximate disposal of the marketable surplus of the gram crop by various agencies in India.*

(Thousand tons.)

Trade blocks.	Market- able surplus.	Growers.		Landlords.		Village merchants.		Cultivators collecting the produce of others.		Itinerant merchants.		Wholesale merchants.		Total.		In villages and periodical markets.	
		Per- cen- tage.	Quan- tity.	Per- cen- tage.	Quan- tity.	Per- cen- tage.	Quan- tity.	Per- cen- tage.	Quan- tity.	Per- cen- tage.	Quan- tity.	Per- cen- tage.	Quan- tity.	Per- cen- tage.	Quan- tity.	Per- cen- tage.	Quan- tity.
United Provinces	519	40.0	207.6	..	..	60.0	311.4	..	..	..	..	..	..	100.0	519.0	..	..
Punjab	444	70.0	310.8	1.5	6.7	20.0	88.8	0.5	2.2	8.0	35.5	..	..	100.0	444.0	..	..
Bihar	88	10.0	8.8	..	..	90.0	79.2	..	..	..	..	..	..	100.0	88.0	..	..
Central Provinces	103	40.0	41.2	3.0	3.1	16.0	16.5	1.0	1.0	16.0	18.5	4.0	4.1	80.0	82.4	20.0	20.6
Bombay	74	56.0	41.4	14.5	10.7	17.5	13.0	3.0	2.2	..	..	8.6	6.4	90.6	73.7	0.4	0.3
Sind	44	..	..	10.0	4.4	25.0	11.0	..	..	25.0	11.0	35.0	15.4	95.0	41.8	5.0	2.2
Bengal	39	17.0	6.6	..	..	15.0	5.8	8.0	3.1	15.0	5.9	40.0	15.6	95.0	37.0	5.0	2.0
North-West Frontier Province	23	42.0	9.7	42.0	9.7	4.0	0.9	..	..	..	..	11.0	2.5	99.0	22.8	1.0	0.2
Madras	3	5.0	6.2	..	..	10.0	0.3	..	..	..	..	10.0	0.3	25.0	0.8	75.0	2.2
Delhi	10	60.0	6.0	..	..	25.0	2.5	5.0	0.5	8.0	0.8	..	..	98.0	9.8	2.0	0.2
Orissa	2	3.0	0.1	1.0	0.1	50.0	1.0	..	..	1.0	0.1	25.0	0.5	80.0	1.8	20.0	0.2
Assam	1	50.0	0.5	..	..	..	..	..	..	..	..	..	..	50.0	0.5	50.0	0.5
H. E. H. the Nizam's Dominions	169	35.0	59.1	..	..	55.0	93.0	..	..	..	..	..	..	90.0	152.1	10.0	16.9
Rajputana	205	25.0	51.3	5.0	10.2	40.0	82.0	..	..	10.0	20.0	10.0	20.5	90.0	184.5	10.0	20.5
Central India States	193	40.0	77.2	10.0	19.3	25.0	48.3	..	..	5.0	9.7	15.0	28.9	95.0	183.3	5.0	9.7
Mysore	6	25.0	1.5	..	..	25.0	1.5	..	..	..	..	..	..	50.0	3.0	50.0	3.0
Total	1923	42.7	822.0	7.5	143.4	35.1	675.9	0.5	9.0	5.2	100.0	4.9	94.2	95.9	1844.5	4.1	78.6

## APPENDIX XXVI.

*List of the more important gram markets in the various provinces and States in India.*

(In thousand maunds.)

Market.	Estimated quantity handled annually.	Market.	Estimated quantity handled annually.
(1) United Provinces—		(4) Central Provinces—	
1. Hapur . . . . .	100	1. Jubbulpore . . . . .	60
2. Shahjahanpur . . . . .	60	2. Goteagaon . . . . .	50
3. Agra . . . . .	125	3. Kareli . . . . .	50
4. Kosi . . . . .	150	4. Gudarwara . . . . .	50
5. Jhansi . . . . .	55	5. Piparya . . . . .	50
6. Orai . . . . .	60	6. Raipur . . . . .	50
7. Kalpi . . . . .	60	7. Drug . . . . .	60
8. Banda . . . . .	80		
9. Maudha . . . . .	150	(5) Bombay—	
10. Karwi . . . . .	60	1. Jalgaon . . . . .	200
11. Atarra . . . . .	150	2. Sholapur . . . . .	100
12. Kunch . . . . .	100	3. Poona . . . . .	250
13. Auraya . . . . .	50	4. Bombay . . . . .	813
14. Meerut . . . . .	70	5. Ahmedabad . . . . .	560
15. Muzaffarnagar . . . . .	75	6. Ahmednagar . . . . .	140
16. Moradabad . . . . .	75	7. Dohad . . . . .	400
17. Bareilly . . . . .	100	8. Surat . . . . .	90
18. Cawnpore . . . . .	250	9. Hubli . . . . .	90
19. Benares . . . . .	60	10. Broach . . . . .	60
(2) Punjab—		(6) Sind—	
1. Mianwali . . . . .	50	1. Karachi . . . . .	2,540
2. Wanbhachran . . . . .	160	2. Sukkur . . . . .	100
3. Piplan . . . . .	80	3. Nawabshah . . . . .	50
4. Hissar . . . . .	100	4. Hyderabad . . . . .	80
5. Rohtak . . . . .	500	(7) Bengal—	
6. Kallukot . . . . .	100	1. Calcutta . . . . .	1,245
7. Gunjyal . . . . .	75		
8. Tohana . . . . .	130	(8) N.-W. F. P.—	
9. Uklana . . . . .	100	1. Laki Marwat . . . . .	60
10. Dabwali . . . . .	200	2. Naurang Serai . . . . .	100
11. Budhlada . . . . .	100	3. Peshawar . . . . .	80
12. Bahadurgarh . . . . .	50	(9) Madras—	
13. Kalluwali . . . . .	60	1. Madras . . . . .	1,918
14. Kaithal . . . . .	300	2. Trichinopoly . . . . .	60
15. Moga . . . . .	70	3. Mangalore . . . . .	50
16. Abohar . . . . .	225	4. Calicut . . . . .	100
17. Malaut . . . . .	75	5. Bellary . . . . .	65
18. Giddarbaha . . . . .	125	6. Cochin . . . . .	60
19. Mukteser . . . . .	60	7. Nandyal . . . . .	50
20. Amritsar . . . . .	300	8. Rajahmundry . . . . .	50
21. Cambellpur . . . . .	60	9. Salem . . . . .	75
22. Gujranwala . . . . .	60	10. Tuticorin . . . . .	2,000
23. Gujrat . . . . .	150	(10) Delhi . . . . .	400
24. Jullundur . . . . .	65		
25. Lahore . . . . .	200	(11) Nizam's Dominion—	
26. Lyallpur . . . . .	140	1. Hyderabad . . . . .	100
27. Multan . . . . .	125	2. Aurangabad . . . . .	50
28. Rawalpindi . . . . .	270	3. Latur . . . . .	50
29. Sialkot . . . . .	175	(12) Gwalior—	
30. Bhatinda . . . . .	380	1. Gwalior . . . . .	200
31. Mansa . . . . .	50	2. Bhilsa . . . . .	50
32. Barnala . . . . .	125	3. Ujjain . . . . .	80
33. Patiala . . . . .	90	(13) Others—	
(3) Bihar—		1. Jodhpur . . . . .	120
1. Patna . . . . .	50	2. Bikaner . . . . .	60
2. Gaya . . . . .	60	3. Datia . . . . .	150
3. Muzaffarpur . . . . .	50	4. Indore . . . . .	60
4. Bhagalpur . . . . .	80	5. Bhopal . . . . .	50
5. Naugachia . . . . .	100		
6. Khagaria . . . . .	100		

## APPENDIX XXVII.

*Difference in the charges incurred in the marketing of gram and wheat at Hapur during 1938 and 1939.*

(Per Rs. 100.)

Particulars	Market charges.	1938.		1939.	
		Gram at Rs. 2-4-0 per maund.	Wheat at Rs. 2-8-0 per maund.	Gram at Rs. 3 per maund.	Wheat at Rs. 2-12-0 per maund.
<i>By seller—</i>					
Octroi . . . . .	6 pies per md.	1-389	1-250	1-042	1-136
Weighment . . . . .	1 ch. per md.	0-156	0-156	0-156	0-156
Dane . . . . .	10 annas per cart . . . .	0-625	0-625	0-625	0-625
Service . . . . .	3½ seers per cart of 15 mds.	0-625	0-625	0-625	0-625
Charity . . . . .	1 anna per cent. . . . .	0-062	0-062	0-062	0-062
Miscellaneous . . . . .	1 ch. per md. . . . .	0-156	0-156	0-156	0-156
Octroi Munshi . . . . .	3 pies per cart . . . . .	0-046	0-042	0-035	0-038
Total . . . . .	.....	Rs. 3-095 3-0-11	2-916 2-14-8	2-001 2-11-3	2-798 2-12-9
<i>By buyer—</i>					
Arhat . . . . .	8 annas per cent. . . . .	0-500	0-500	0-500	0-500
Charity . . . . .	6 pies per cent. . . . .	0-031	0-031	0-031	0-031
Cartage . . . . .	3 pies per bag . . . . .	0-278	0-250	0-208	0-227
Stitching and filling . . . . .	Rs. 5-3-0 per 100 bags . . . .	0-922	0-830	0-692	0-755
Total . . . . .	.....	Rs. 1-731 1-11-9	1-611 1-9-9	1-431 1-6-11	1-513 1-8-3
GRAND TOTAL . . . . .	.....	Rs. 4-12 8	4-8-5	4-2-2	4-3-0

# APPENDIX XXVIII.

Market charges on grām worth Rs. 100 in certain markets.

Items of cost.	Bombay.						
	Ahmedabad.	Jalgaon.	Kopergaon.	Barsi.	Bijapur.	Belgaum.	Average.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
<i>Payable by seller—</i>							
Handling up to weightment	0 7 8	..	1 2 10	0 2 5	0 4 0	0 7 2	0 6 8
Commission	1 0 0	..	1 9 0	1 0 0	0 15 3	1 9 0	1 0 2
Brokerage	..	0 6 10	..	..	..	..	0 1 2
Charity	0 2 0	0 3 5	0 2 0	0 4 0	0 3 0	0 2 0	0 2 9
Miscellaneous	..	..	0 4 6	0 8 0	..	..	0 2 1
Total	1 9 8	0 10 3	3 2 4	1 14 5	1 6 3	2 2 2	1 12 10
<i>Payable by buyer—</i>							
Handling and weightment	..	..	0 5 2	0 5 7	0 7 2	0 2 5	0 3 5
Commission	2 2 0	0 5 2	1 0 0	1 0 0	1 0 0	1 9 0	1 2 8
Brokerage	0 2 7	..	..	..	..	..	0 0 5
Charity	..	..	0 4 0	0 2 0	0 2 0	..	0 1 4
Miscellaneous	0 2 7	..	..	..	..	..	0 0 5
Total	2 7 2	0 5 2	1 9 2	1 7 7	1 9 2	1 11 5	1 8 3
Rebate received by buyer	..	..	1 9 2	1 7 7	..	0 12 0	0 2 0
Net payable by buyer	2 7 2	0 5 2	..	..	1 9 2	0 15 5	1 6 3

# APPENDIX XXVIII—contd.

Market charges on gram worth Rs. 100 in certain markets.

Items of cost.	Bihar.						Central Provinces.																	
	Luckiesarai.		Bettiah.		Darbhanga.		Average.		Jubbulpore.		Saugor.		Damoh.		Goteagaon.		Piparya.		Godarwara.		Avera.			
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.			
<i>Payable by seller—</i>																								
Handling—																								
(a) up to weightment .	0	2	0	0	1	1	0	10	0	..	..	..	..	..	..	..	..	..	..	..	..	..		
(b) from weightment to godown.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
Karda, dhalla and dane .	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
Commission .	0	12	0	0	14	0	0	12	0	0	10	0	0	8	0	0	12	0	0	10	0	0		
Brokerage .	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
Charity .	0	1	0	0	4	10	0	1	0	0	2	3	0	2	3	0	2	6	0	5	0	0		
Miscellaneous .	0	7	11	0	3	4	0	1	11	..	..	..	0	3	4	0	12	0	1	4	0	1		
Octroi, toll, market cess, etc. .	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
Total .	1	6	11	1	7	3	2	8	11	1	8	3	1	11	10	6	2	8	4	5	4	4	12	8
<i>Payable by buyer—</i>																								
Handling and weightment .	0	3	0	0	2	7	0	13	4	0	4	5	0	5	10	0	13	3	0	13	3	0	5	3
Dams .	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
Commission .	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
Brokerage .	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
Charity .	0	2	0	0	1	6	0	1	0	0	2	3	0	1	8	..	..	..	..	..	..	..	..	
Miscellaneous .	0	2	0	0	..	..	0	2	11	..	..	..	0	1	3	..	..	..	..	..	..	..	..	
Total	0	7	0	1	2	1	1	13	3	1	2	8	1	2	3	0	13	3	0	13	3	0	10	1
Less allowances	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
Net amount payable	0	7	0	1	2	1	0	13	3	0	8	8	0	11	9	0	11	3	+0	14	9	+0	9	9

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## APPENDIX XXIX.

Trade (rail and river-borne) in grain between different provinces and States of India.  
(Average 1937-38 to 1939-40).

(In tons).

Whence despatched	ARRIVALS IN																	Total.
	Madras (b).	Bombay (c).	Bengal (d).	United Pro- vinces.	Pun- jab.	Central Pro- vinces and Berar.	Bihar.	Assam.	N.W. F. P.	Orissn.	Sind and British Baluchi- stan (e).	Delhi Pro- vince.	Hyde- rabad.	Mysore.	Raj- putana.	Central India.	Kash- mir.	
Madras (b) . . . . .	..	176	90	2	(a)	3	1	..	..	61	.. 1	.. 5	241	5,885	..	..	..	6,450
Bombay (c) . . . . .	2,191	..	1	16	6	68	(a)	..	..	2	(a)	(a)	159	1,176	21	6	(a)	3,652
Bengal (d) . . . . .	958	..	..	6	(a)	1	735	508	..	54	..	..	3	..	4	..	..	2,269
United Provinces . . . . .	26,551	25,735	11,683	..	2,804	1,466	8,635	608	4	116	5,694	7,408	1,347	1,183	1,084	433	..	95,057
Punjab . . . . .	36,506	9,927	114	5,196	..	958	138	13	5,779	3	37,513	5,769	364	2,513	2,069	271	1,056	108,189
Central Provinces and Berar . . . . .	10,368	17,077	2,482	202	12	..	615	..	(a)	1,056	..	20	981	714	27	518	..	34,081
Bihar . . . . .	5,148	8	21,311	1,049	(a)	3	..	2,348	..	527	3	12	..	55	(a)	..	..	30,464
Assam . . . . .	..	..	21	7	..	..	1	..	..	..	.. 8	..	..	..	..	..	..	29
North-West Frontier Province . . . . .	..	..	..	2	1,653	2	(a)	..	..	..	..	..	9	..	(a)	..	..	1,674
Orissa . . . . .	6,572	..	702	(a)	..	69	90	12	325	..	..	335	.. 2	..	..	(a)	..	7,445
Sind and British Balu- chistan (e) . . . . .	24	18	5	54	1,717	42	..	..	..	..	..	..	..	70	..	..	..	2,392
Delhi Province . . . . .	525	71	9	18	38	3	5	..	1	2	4	.. 2	37	..	4	7	..	724
Hyderabad . . . . .	14,202	1,078	..	(a)	3	46	..	..	..	..	..	..	34	1,765	..	1	..	17,097
Mysore . . . . .	1,661	322	..	..	..	(a)	..	..	..	..	..	..	80	.. 14	(a)	..	..	2,017
Rajputana . . . . .	1,004	12,063	28	175	2,412	1,011	9	(a)	6	2	12,631	102	265	..	768	247	..	29,784
Central India . . . . .	6,422	9,062	94	1,053	68	1,756	136	(a)	..	276	273	389	265	1,369	..	..	(a)	21,931
Kashmir . . . . .	..	..	..	..	4	..	..	..	..	..	..	..	..	..	..	..	..	4
Total . . . . .	112,132	75,537	36,540	7,780	8,717	5,428	10,365	3,480	6,115	2,099	56,127	13,851	3,522	14,744	4,877	1,483	1,056	363,862

Source—Compiled from Accounts relating to the Inland (rail and river-borne) Trade of India.

- (a) Less than 10 cwts.  
(b) Including Madras chief port and other Madras ports.  
(c) Including Bombay Port.  
(d) Including Calcutta.  
(e) Including Karachi.

## APPENDIX XXX.

*Periodicity of inter-provincial rail and river-borne exports trade in gram, in respect of the chief exporting provinces.*

(Average 1937-38 to 1939-40).

(In tons).

Exports from.	April.	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	Total.
Punjab (including States).	11,502 (10·6)	14,708 (13·6)	13,445 (12·4)	11,209 (10·4)	8,062 (7·4)	9,519 (8·8)	6,173 (5·7)	6,558 (6·1)	7,889 (7·3)	7,098 (6·6)	6,148 (5·7)	5,878 (5·4)	108,189 (100·0)
United Provinces	12,860 (13·4)	12,805 (13·4)	6,363 (6·7)	5,765 (6·0)	6,834 (7·1)	8,141 (8·5)	8,337 (8·7)	9,424 (9·9)	8,972 (9·4)	5,329 (5·6)	4,579 (4·8)	6,242 (6·5)	95,651 (100·0)
(Central Provinces and Berar.	3,868 (11·3)	3,495 (10·3)	1,853 (5·4)	1,583 (4·6)	1,658 (4·9)	1,982 (5·8)	2,373 (7·0)	2,590 (7·6)	2,296 (6·7)	2,395 (7·0)	3,496 (10·3)	6,492 (19·1)	34,081 (100·0)
Bihar . . .	2,880 (9·5)	3,590 (11·8)	2,540 (8·3)	2,697 (8·8)	2,282 (7·5)	3,092 (10·1)	3,525 (11·6)	2,778 (9·1)	2,341 (7·7)	2,033 (6·7)	1,343 (4·4)	1,363 (4·5)	30,464 (100·0)
Total . . .	31,110	34,598	24,201	21,254	18,836	22,734	20,408	21,350	21,498	16,855	15,566	19,975	268,385

*Source—Accounts relating to Rail and River-borne Trade of India.  
Figures in brackets represent percentage on total exports.*

## APPENDIX XXXI.

*Periodicity of inter-provincial rail and river-borne import rate in gram, in respect of the chief importing provinces.*

(Average 1937-38 to 1939-40).

(In tons).

Imports into.	April.	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	Total.
Madras Province	12,174 (10.8)	9,516 (8.5)	7,588 (6.8)	9,038 (8.1)	8,606 (7.7)	11,228 (10.0)	9,029 (8.0)	7,845 (7.0)	10,769 (9.6)	8,291 (7.3)	9,150 (8.2)	8,998 (8.0)	112,232 (100.0)
Bombay Province	10,631 (14.0)	9,860 (13.0)	5,949 (7.9)	3,832 (5.1)	5,056 (6.7)	5,813 (7.7)	5,107 (6.8)	6,634 (8.8)	5,759 (7.6)	4,239 (5.6)	4,512 (6.0)	8,145 (10.8)	75,537 (100.0)
Sind-Baluchistan	5,664 (10.1)	9,703 (17.3)	10,159 (18.1)	5,934 (10.6)	2,641 (4.7)	2,720 (4.8)	1,879 (3.3)	3,409 (6.1)	4,153 (7.4)	3,952 (7.0)	2,743 (4.9)	3,180 (5.7)	56,127 (100.0)
Bengal	3,478 (9.5)	3,794 (10.3)	2,483 (6.7)	1,996 (5.5)	2,468 (6.8)	3,205 (8.8)	4,477 (12.3)	4,898 (12.9)	2,213 (6.1)	2,734 (7.5)	2,241 (6.1)	2,763 (7.6)	36,540 (100.0)
Total	31,947 (11.4)	32,873 (11.7)	26,179 (9.3)	20,800 (7.4)	18,771 (6.7)	22,966 (8.2)	20,492 (7.3)	22,586 (8.1)	22,894 (8.2)	19,216 (6.9)	18,646 (6.6)	23,076 (8.2)	280,446 (100.0)

Source—Accounts relating to Rail and River-borne Trade of India.  
Figures in brackets represent percentage on total import.

## APPENDIX XXXII.

*Trend of rail and river-borne exports of gram from the chief exporting provinces of India.*  
(In tons).

Name of province.	1937-38.		1938-39.		1939-40.		1940-41.		Remarks.
	Production of previous crop year (1936-37).	Exports.	Production of previous crop year (1937-38).	Exports.	Production of previous crop year (1938-39).	Exports.	Production of previous crop year (1939-40).	Exports.	
Punjab . . . . .	952,982	180,536	639,988	93,976	374,992	50,045	498,990	53,373	
United Provinces . . . . .	1,916,964	81,243	1,642,969	84,379	1,480,972	121,325	1,677,968	126,945	
Central Provinces and Berar . . . . .	208,996	21,140	222,996	35,779	184,996	45,323	196,000	34,235	
Bihar . . . . .	449,991	33,045	452,991	41,206	414,992	17,139	458,991	17,118	
Total . . . . .	3,528,933	315,964	2,958,944	255,340	2,457,952	233,832	2,831,949	231,671	

*Note.*—The inter-provincial trade figures refer to the whole trade blocks (e.g. Punjab, including States, etc.), but production figures are in respect of the province only.  
*Source.*—Compiled from Accounts relating to the Inland (rail and river-borne) Trade of India.

# APPENDIX XXXIII.

*Trend of rail and river-borne imports of gram into the chief importing provinces of India.*

(In tons)

Name of province	1937-38.		1938-39.		1939-40.		1940-41.	
	Local pro- duction in previous year (1936-37).	Imports.	Local pro- duction in year (1937-38).	Imports.	Local pro- duction in previous year (1938-39).	Imports.	Local pro- duction in previous year (1939-40).	Imports.
Madras Province	13,989	125,282	9,992	119,817	10,992	91,587	13,989	118,670
Bombay Province	86,934	88,298	94,928	65,294	90,931	73,146	77,941	80,698
Sind-Baluchistan	49,462	76,665	54,959	55,502	46,964	36,212	48,963	29,642
Bengal	67,949	38,194	71,946	43,349	96,927	28,103	83,937	32,174
Total	218,834	328,439	231,825	283,962	245,814	229,048	224,830	261,184

*Note*—The import figures refer to the trade blocks of Madras, Bombay, etc. (after adjusting for port towns) and thus include enclosed Indian States. The production figures shown refer to the province only.

*Source*.—Accounts relating to the Inland (rail and river-borne) Trade of India, and Estimates of Area and Yield of the Principal Crops of India.

## APPENDIX XXXIV.

(a) *Coastal exports of gram from different provinces in India.*

(Tons.)

Province.	1935-36.	1936-37.	1937-38.	1938-39.	1939-40.	Average 1935-36 to 1939-40.
Bengal . . . . .	29	..	187	222	206	129
Orissa . . . . .	101	137	525	3,394	972	1,026
Bombay . . . . .	3,227	2,304	2,020	3,985	3,240	2,955
Sind . . . . .	49,527	39,693	38,318	26,005	18,547	34,418
Madras . . . . .	860	318	61	248	84	314
Total . . . . .	53,744	42,452	41,111	33,854	23,049	38,842

(b) *Coastal imports of gram into different provinces of India.*

(Tons.)

Province.	1935-36.	1936-37.	1937-38.	1938-39.	1939-40.	Average 1935-36 to 1939-40.
Bengal . . . . .	1,053	820	616	787	116	678
Orissa . . . . .	..	275	442	240	..	191
Bombay . . . . .	850	2,161	1,962	1,200	933	1,421
Sind . . . . .	33	28	33	120	54	54
Madras . . . . .	52,396	37,756	37,725	31,533	21,542	36,191
Total . . . . .	54,332	41,040	40,778	33,880	22,645	38,535

*Source.*—Accounts relating to the Coasting Trade and Navigation of British India.

## APPENDIX XXXV.

*Periodicity in the coastal trade in gram.*

(Tons.)

	Exports (Sind).					Imports (Madras).				
	1937-38.	1938-39.	1939-40.	Average.	Per cent.	1937-38.	1938-39.	1939-40.	Average.	Per cent.
April . . . . .	2,551	1,859	814	1,741	6.3	1,244	1,909	2,375	1,843	6.1
May . . . . .	3,537	3,315	1,035	2,629	9.5	2,020	1,570	3,353	2,314	7.6
June . . . . .	1,700	3,403	634	1,912	6.9	3,442	1,578	1,008	2,009	6.6
July . . . . .	6,251	3,783	2,410	4,148	15.0	3,175	2,676	852	2,234	7.4
August . . . . .	1,822	3,477	1,340	2,146	7.8	4,893	3,291	1,740	3,308	10.0
September . . . . .	4,415	2,734	2,603	3,251	11.8	3,957	5,257	2,078	3,764	12.4
October . . . . .	5,528	1,620	1,234	2,794	10.1	4,286	3,001	1,233	2,840	9.4
November . . . . .	2,071	1,460	1,357	1,629	5.9	4,214	3,696	1,033	2,981	9.0
December . . . . .	2,506	2,021	1,978	2,168	7.9	1,429	1,284	2,184	1,632	5.4
January . . . . .	3,574	874	3,098	2,515	9.1	2,507	2,372	2,006	2,295	7.6
February . . . . .	2,033	617	1,150	1,267	4.6	3,586	2,435	2,191	2,737	9.1
March . . . . .	2,530	842	894	1,422	5.1	2,972	2,464	1,489	2,308	7.6
Total . . . . .	38,318	26,005	18,547	27,622	100.0	37,725	31,533	21,542	30,265	100.0

## APPENDIX XXXVI.

*Merchandising charges on gram worth Rs. 100 from producer to consumer in certain markets.*

Items of cost.	Village in Sukkur to Karachi (Sind).	Laki Marwat to Peshawar (N.-W. F. P.).	Moga to Lahore (Punjab).	Kareli to Khandwa (C. P.).	Aurangabad to Hyderabad.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
<i>Paid by seller—</i>					
Octroi . . . . .	1 0 0	..	..	..	0 3 9
Handling up to weighment . . . . .	0 11 2	..	0 5 0	1 0 6	0 3 10
Karda, dhalta or dane . . . . .	..	..	0 5 0	1 4 0	..
Commission . . . . .	0 8 0	4 8 9	..	0 12 0	2 4 0
Brokerage . . . . .	..	..	..	0 5 0	..
Charity . . . . .	..	..	0 1 3	0 5 0	..
Miscellaneous . . . . .	..	..	0 4 10	0 9 6	0 2 10
<b>Total</b> . . . . .	<b>2 3 2</b>	<b>4 8 9</b>	<b>1 0 1</b>	<b>4 4 0</b>	<b>0 14 5</b>
<i>Paid by buyer in the assembling market—</i>					
Weighment . . . . .	0 8 0	6 7 3	..	..	0 3 10
Handling after weighment . . . . .	0 8 0	0 7 3	..	..	0 2 4
Twine . . . . .	..	0 0 7	..	0 0 9	..
Commission . . . . .	0 8 0	4 8 9	0 12 0	0 12 0	1 0 0
Dani . . . . .	..	..	1 3 0	..	..
Brokerage . . . . .	..	0 3 0	0 1 3	..	..
Charity . . . . .	0 1 0	0 14 7	0 0 6	0 2 0	0 2 4
Cartage to railway station . . . . .	0 10 11	..	0 11 0	0 10 10	0 4 8
Station charges (gratifications.) . . . . .	0 5 4	0 0 7	0 4 11	..	0 9 4
Terminal tax . . . . .	..	..	1 0 5	0 13 4	..
Depreciation on bags . . . . .	1 1 9	1 0 9	1 3 8	1 0 0	0 12 8
Any other expenses . . . . .	..	..	..	0 7 0	..
<b>Total</b> . . . . .	<b>3 11 0</b>	<b>7 10 9</b>	<b>3 5 9</b>	<b>3 13 11</b>	<b>3 3 2</b>
<i>Buyer's expenses at destination—</i>					
Railway freight . . . . .	16 0 0	17 6 9	4 9 10	17 4 8	24 9 0
Octroi or terminal tax . . . . .	0 8 0	0 9 1	1 8 7	1 4 0	..
Cartage to godown . . . . .	0 13 4	0 14 7	1 8 7	1 0 0	1 7 4
Overhead charges . . . . .	0 2 8	..	..	..	..
Cooly charges including godown rent. . . . .	2 0 0	4 8 9	2 14 0	0 4 7	..
Wholesaler's margin . . . . .	6 0 0	4 8 9	..	3 4 0	6 0 0
Carting to shop . . . . .	..	..	..	0 4 0	..
Hamali and other expenses . . . . .	..	..	..	0 4 0	..
Retailer's margin . . . . .	12 0 0*	14 15 5*	..	2 4 0	9 0 0*
<b>Total</b> . . . . .	<b>37 8 0</b>	<b>42 15 4</b>	<b>..</b>	<b>25 13 3</b>	<b>41 0 4</b>

\* Includes cost.

## APPENDIX XXXVII.

Certain physical characteristics of gram grown in India.

Province or State.	Refraction percentage.										Natural test weight in pounds.			Weight per 1,000 kernels in grammes.			Ratio of shell to kernel.
	Dirt.		Non-food grains, e.g., oilseeds, etc.		Other food grains, e.g., wheat, barley, peas, etc.		Immature and shrivelled, etc.		Damaged or unsound.		Weevilled grains.		Aver. age.	Maxi. mum.	Mini. mum.		
	Aver. age.	Maxi. mum.	Aver. age.	Maxi. mum.	Aver. age.	Maxi. mum.	Aver. age.	Maxi. mum.	Aver. age.	Maxi. mum.	Aver. age.	Maxi. mum.				Mini. mum.	
<i>United Provinces—</i>																	
Western . . . . .	0.36	2.58	1.77	25.64	0.59	3.66	1.26	5.44	0.21	1.44	2.95	55.52	57.9	125.64	257.00	106.06	1 : 4.03
Bundelkhand . . . . .	2.24	8.55	0.66	3.59	1.78	5.70	0.66	2.78	0.07	0.46	13.27	75.50	45.9	127.31	161.12	110.12	1 : 4.20
Eastern . . . . .	0.25	1.08	2.37	20.91	0.73	16.45	0.81	3.49	0.27	1.17	5.26	29.45	56.0	121.49	152.40	101.20	1 : 4.00
<i>Punjab—</i>																	
South-eastern . . . . .	0.17	0.50	0.49	4.39	0.62	2.19	1.74	7.43	0.38	1.37	1.50	7.54	60.4	121.81	151.82	100.80	1 : 4.52
Central . . . . .	0.23	3.08	0.44	4.36	1.50	7.02	0.81	2.31	0.33	1.40	1.57	12.09	57.5	120.77	300.00	101.53	1 : 4.23
North-western . . . . .	0.19	0.51	0.19	0.58	0.54	2.35	1.80	6.43	0.35	1.37	0.49	1.93	61.0	113.32	120.76	92.80	1 : 4.27
Bihar . . . . .	0.92	2.12	1.10	5.57	0.8	3.61	0.96	5.09	0.27	2.49	5.90	30.07	54.6	127.40	389.52	82.15	1 : 4.27
<i>Central Provinces</i>																	
. . . . .	1.37	4.08	4.90	33.62	2.05	10.95	0.75	2.42	0.32	3.11	7.49	90.38	49.8	127.70	148.70	100.05	1 : 4.99
Sind . . . . .	0.77	2.84	0.68	1.38	0.29	2.49	2.53	7.08	0.39	1.12	1.01	2.80	60.7	128.95	244.92	100.80	1 : 5.19
Hyderabad . . . . .	2.12	10.9	0.31	0.64	0.19	3.25	0.63	4.96	0.44	1.07	7.11	34.31	57.8	119.69	228.00	103.00	1 : 4.40



Bases of refraction for "futures" transactions in use by some associations for grain contracts.

Associations.	Dirt contents.				Barley, wheat and/or other food grains.				Remarks.
	Free tolerance.	Deduction, if in excess of tolerance.	Option to reject if over.	Free tolerance.	Deduction, if in excess of tolerance.	Option to reject if over.	Free tolerance.	Deduction, if in excess of tolerance.	
	per cent.		per cent.	per cent.		per cent.	per cent.		
1. The Chamber of Commerce, Nagpur.	2	At full value.	3	5	At full value.	8	..	..	In case the combined total of dirt and other food grain does not exceed 5 per cent., the buyer is bound to take delivery.
2. The Chamber of Commerce, Gaziabad.	2	..	2	3	..	3	..	..	
3. The Shree Brij Beopar Mandal, Ltd., Muttra.	1	At full value.	2	2	At half value.	4	..	..	
4. The Chamber of Commerce, Hathras.	1.5	Do.	1.5	2.5	..	2.5	..	..	Wheat will be reckoned as grain without discount or premium.
5. Shri Dauji Beopar Mandal, Ltd., Kosi-Kalan (U. P.).	2	Do.	3	2+	..	2.5+	1	..	Ditto.
6. The Aigarh Merchants' Association, Ltd., Aigarh.	2	Do.	3	9	At half value.	17+	..	..	† 1.5 per cent. other grains and 1 per cent. wheat excess to be treated as dust.
7. The Lyallpur Sherm Shunder Trading Co., Ltd., Lyallpur.	1½	Do.	2	3	At full value.	4	1	At half value	† Green grain up to 9 per cent., peas 4 per cent., barley 2 per cent., wheat 2 per cent.
8. The Bharat Krishna Trading Co., Ltd., Okara.	2	Do.	3	2	At half value.	5	2	Do.	Black grains are also included in the specification. Up to 8 per cent. free tolerance and over 8 up to 12 per cent. at 25 per cent. of value.
9. The Oriental Chamber of Commerce, Ltd., Multan.	2	Do.	3	2	Do.	5	2	Do.	
10. The Bankers' Corporation, Ltd., Abohar.	1½	Do.	2	1	Do.	1	1	Do.	
11. The Grain and Cotton Merchants' Co., Ltd., Ludhiana.	1½	At half value.	2	..	..	..	1	Do.	Other food grains treated as dirt.
12. Dwarka Das & Co., Ltd., Bhiwani (Punjab).	1½	At full value.	2	1	At full value.	1	1	..	
13. Indian Merchants' Association, Karachi.*	3	..	3	4	(2 per cent. at half value 1 per cent. dirt.)	7	2	2 per cent. at ½ value and 2 per cent. at half value.	

\* Black = 2 per cent. free, excess ½ dirt up to 8 per cent., over 8 per cent. to be rejected. White = 3 per cent. free, excess ¼ dirt up to 5 per cent., over 5 per cent. half dust up to 7 per cent., over 7 per cent. to be rejected. Greens = 6 per cent. free, excess ¼ into dirt up to 10 per cent., above 10 per cent. to be rejected.

## APPENDIX XXXIX.

*Terms of sale in respect of "ready" delivery contracts of gram prescribed by the Merchants' Chamber of Commerce Ltd., Bombay.*

Refraction (*khad*) is allowed up to 4 per cent. mutual.

If there be any other food grain in gram, it is valued, if up to 2 per cent. at half the (*kabala*). Contract price.

In the old crop (August to March), weevilled grain up to 2 per cent. is allowed, but if the weevilled grain is more than 2 per cent. it is valued at three-fourth of the contract price.

Damaged grain is allowed up to  $\frac{1}{2}$  per cent., but if it is more than  $\frac{1}{2}$  per cent., it is valued at half the contract price.

The district to which the produce belongs must be specified in the *kabala* (contract form).

## APPENDIX XL.

*Tolerances for weevilled gram in different months provided for by some associations.*

Name of association.	Months of delivery and percentage of weevilled grain allowed.	Per cent.	Remarks.
The Lyallpur Sham Sunder Trading Company Ltd., Lyallpur.	Har . . . . .	1	Weevilled grains are accepted at 25 per cent. of the value.
....	Sawan . . . . .	1½	
....	Bhadon . . . . .	2	
....	Asuj . . . . .	3	
....	Katak . . . . .	4	
....	Maghar to Magh . . . . .	5	
....	Phagun to Baisakh . . . . .	6	
The Bharat Krishen Trading Co., Ltd., Okara.	Har . . . . .	1	Allowed at full value but acceptable up to 6 per cent. when $\frac{1}{2}$ value is allowed on the quantity in excess of free tolerance.
....	Sawan & Bhadon . . . . .	2	
....	Afterwards . . . . .	4	
The Oriental Chamber of Commerce Ltd., Multan.	Ditto . . . . .	..	Do.
The Bankers' Corporation Ltd., Abchar.	Sawan . . . . .	$\frac{1}{2}$	Excess up to 1 per cent. at half value.
....	Asuj to Chet . . . . .	1	Excess up to 2 per cent. half value.
Grain & Cotton Merchants' Company Ltd., Ludhiana.	Har . . . . .	$\frac{1}{2}$	Excess up to $\frac{1}{2}$ per cent. at half value.
....	Asuj . . . . .	1	Excess up to $\frac{1}{2}$ per cent. at half value.
....	Maghar . . . . .	1½	Excess up to 2 per cent. at half value.
....	Magh, Chet and Baisakh . . . . .	2	Excess up to 2½ per cent. at half value.
The Indian Merchants' Chamber of Commerce, Karachi.	April . . . . .	2	Excess $\frac{1}{2}$ into dirt. up to 4 per cent.; over 4 per cent. to be taken $\frac{1}{2}$ into dirt up to 6 per cent. to be rejected.
....	May . . . . .	Nil	Excess to be taken $\frac{1}{2}$ into dirt up to 0.05 per cent.; over 0.05 per cent. to be rejected.
....	June . . . . .	Nil	Excess $\frac{1}{2}$ into dirt up to 0.10 per cent.; over 0.10 per cent. to be rejected.
....	July . . . . .	Nil	Excess $\frac{1}{2}$ into dirt up to 0.25 per cent. over 0.25 per cent. $\frac{1}{2}$ into dirt. up to 0.50 per cent.; over 0.50 per cent. to be rejected.

APPENDIX XI—*contd.**Tolerances or weevil'd grain in different months provided for by some associations—contd.*

Name of association.	Months of delivery and percentage of weevil'd grain allowed.	Per cent.	Remarks.
The Indian Merchants' Chamber of Commerce, Karachi— <i>contd.</i>  ....  ....  ....  ....	August . . . . .	$\frac{1}{2}$	Excess $\frac{1}{2}$ into dirt. up to 1 per cent. over 1 per cent. to be taken $\frac{1}{2}$ into dirt up to 2 per cent. over 2 per cent. to be rejected.
	September . . . . .	1	Excess $\frac{1}{2}$ into dirt. up to 2 per cent.; over 2 per cent. $\frac{1}{2}$ into dirt. up to $2\frac{1}{2}$ per cent.; over $2\frac{1}{2}$ per cent. to be rejected.
	October . . . . .	$1\frac{1}{2}$	Excess $\frac{1}{2}$ into dirt. up to 3 per cent.; over 3 per cent. to be rejected.
	November . . . . .	2	Excess $\frac{1}{2}$ into dirt. up to 4 per cent.; over 4 per cent. to be rejected.
	December . . . . .	2	Excess $\frac{1}{2}$ into dirt. up to 4 per cent.; over 4 per cent. $\frac{1}{2}$ into dirt. up to 6 per cent.; over 6 per cent. to be rejected.

## APPENDIX XII.

*List showing the number and location of some important mills processing gram (1939).*

Name of mill.	Approximate quantity handled per annum. (mds.)	Name of mill.	Approximate quantity handled per annum. (mds.)
<b>United Provinces—</b>		<b>Punjab <i>contd.</i></b>	
Messrs. Narain Prasad Suraj Bhan, Agra.	150,000	Bahadurgarh (Rohtak) (1 mill)	30,000
Messrs. Chittarmal Narain Das, Agra.		Hissar (2 mills)	40,000
Messrs. Ramchawar Gram Dal Flour Mill, Agra.		Dabwali (Hissar) (3 mills)	125,000
Kalpi Dall Mills, Kalpi	70,000	Mianwali (1 mill)	26,000
<b>Punjab—</b>		The Bhopendra Flour Mills, Bhatinda.	300,000
Noga (Ferozepur) (mills)	100,000	<b>Central Provinces—</b>	
Budhlada (Hissar) (5 mills)	250,000	The Mahakoshal Roller Mill (Raipur).	30,000
Amritsar (5 mills)	100,000	The Maharashtra Flour Mill (Raipur).	25,000

APPENDIX XLI—*contd.**List showing the number and location of some important mills processing gram (1939)—contd.*

Name of mill.	Approximate quantity handled per annum. (mds.)	Name of mill.	Approximate quantity handled per annum. (mds.)
<b>Bombay—</b>		<b>Sind—<i>contd.</i></b>	
1. Gopal Krishna Flour & Pulse Mills, Raipur Gate, Ahmedabad.	1,80,000	The Laxmi Flour Mill, Karachi .	325,000
2. Shri Krishna Roller Flour Mills, Prem Darwaza, Ahmedabad.	80,000	Shri Shivaji Rice & Dal Mill, Karachi.	750,000
3. Shri Ramchodrao Flour Mills, Godhia.	55,000	The Dembla Flour Mill, Sukkar .	70,000
4. Nawjiwan Roller Flour Mills Ltd., Dohad.	65,000	<b>Gwalior—</b>	
5. Goverdhends Dal & Flour Mills, Jalgaon.	35,000	Phoolchand Ram Narayan Mill, Morena.	50,000
		Sri Maheshwari Mill, Morena .	75,000
<b>Sind—</b>		Phoolchand Padamchand Mill, Morena.	40,000
Kitoon Light Flour Mill, Karachi .	370,000	Ganesh Mill, Morena . . . .	30,000
Vishnu Flour Mill, Karachi . . .	600,000	Kothari Mill, Morena . . . .	50,000
Light Flour Mill, Karachi . . .	750,000	Nondil Dal Mill, Morena . . .	51,000
Mangnani Dhall Flour Mill, Karachi.	500,000	The Malwa Dal & Baisin Mill, Ujain.	27,000
The Bharat Flour Mill, Karachi .	500,000	The Onkar Flour Mill, Ujain .	50,000

## APPENDIX XLII.

*Net available supplies of gram dal in different tracts in India.*

(Thousand tons.)

Trade Blocks.	Local production.	Imports.	Exports.	Net available supply.
United Provinces . . . . .	62.0	1.5	10.0	53.5
Punjab . . . . .	101.0	n	37.0	54.0
Bihar . . . . .	18.0	2.0	n	20.0
Central Provinces . . . . .	17.0	3.7	0.4	20.3
Bombay . . . . .	30.0	10.0	0.2	39.8
Sind . . . . .	17.0	4.5	15.0	6.5
Bengal . . . . .	25.0	16.0	n	41.0
North-West Frontier Province . . . . .	6.0	..	..	6.0
Madras . . . . .	..	37.0	n	37.0
Orissa . . . . .	1.0	0.9	n	1.9
Delhi . . . . .	4.7	1.0	1.3	4.4
Assam . . . . .	1.6	0.1	n	1.7
Hyderabad . . . . .	35.0	1.5	1.5	35.0
Rajputana States . . . . .	47.0	0.8	11.5	36.3
C. I. States . . . . .	40.0	0.5	6.0	34.5
Mysore . . . . .	2.2	3.4	n	5.5
<b>Total' . . . . .</b>	<b>407.5</b>	<b>82.9</b>	<b>82.9</b>	<b>407.5</b>

n—Below 500 tons.

## APPENDIX XLIII.

*Net available supplies of basins in different tracts in India.*

(Thousand tons.)

Trade Blocks.	Local production.	Imports.	Exports.	Net available supply.
United Provinces . . . . .	31·0	1·0	9·0	23·0
Punjab . . . . .	43·0	2·0	20·0	25·0
Bihar . . . . .	4·6	5·0	n	8·6
Central Provinces . . . . .	3·0	1·0	u	4·0
Bombay . . . . .	42·7	3·0	n	45·7
Sind . . . . .	8·0	3·0	5·0	6·0
Bengal . . . . .	3·0	8·0	n	11·0
North-West Frontier Province . . . . .	2·0			2·0
Madras . . . . .	1·7	14·0	..	15·7
Orissa . . . . .	1·0	n	..	1·0
Delhi . . . . .	5·1	1·0	2·0	4·1
Assam . . . . .	1·0	2·0	..	3·0
Hyderabad . . . . .	46·0	n	n	46·0
Rajputana States . . . . .	28·0	u	2·0	26·0
C. I. States . . . . .	28·0	n	4·0	24·0
Mysore . . . . .	1·3	3·0	..	4·3
Total	249·4	42·0	42·0	249·4

n—Below 500 tons.

## APPENDIX XLIV.

*Production of chooni and husk from gram processed in power-driven chakkis.*

(Thousand tons.)

	Chooni.	Husk.
United Provinces . . . . .	23·5	10·1
Punjab . . . . .	41·9	17·2
Bihar . . . . .	6·8	2·1
Central Provinces and Berar . . . . .	4·3	1·9
Bombay . . . . .	12·7	7·0
Sind . . . . .	6·3	2·7
Bengal . . . . .	6·8	2·9
North-West Frontier Province . . . . .	2·1	0·9
Madras . . . . .	..	..
Orissa . . . . .	0·6	0·2
Delhi . . . . .	2·4	1·0
Assam . . . . .	0·7	0·3
Hyderabad . . . . .	12·9	6·5
Rajputana . . . . .	19·4	8·3
C. I. States . . . . .	17·5	7·5
Mysore . . . . .	0·8	0·3
Total . . . . .	158·7	68·9

## APPENDIX XLV.

Wholesale prices of gram and dal at Datia.

(Per maund of 82 2/7 lb.)

—	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Average.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
1937.													
Datia—													
Gram . . .	2 2 6	2 0 6	2 0 3	2 5 6	2 5 3	2 7 6	2 7 3	2 6 0	2 5 0	2 5 0	2 4 0	2 3 9	2 4 5
Dal . . .	2 15 6	2 13 9	2 13 9	3 5 3	3 7 9	3 10 3	3 7 3	3 6 0	3 4 3	2 15 6	3 1 3	3 1 3	3 3 2
1938.													
Datia—													
Gram . . .	2 5 9	2 2 6	1 15 6	1 13 9	1 15 3	2 0 9	2 3 6	2 2 0	2 4 0	2 6 9	2 8 0	2 9 9	2 3 3
Dal . . .	3 2 3	3 6 3	2 14 6	2 15 6	2 11 9	3 0 3	3 2 3	2 15 6	3 4 3	3 5 4	3 4 3	3 13 0	3 2 7
1939.													
Datia—													
Gram . . .	2 14 3	2 8 3	2 9 3	2 7 3	2 10 9	2 10 9	2 13 0	2 13 3	3 0 6	2 15 9	3 0 3	3 9 3	2 13 5
Dal . . .	3 10 3	3 9 6	3 10 3	3 13 0	3 13 0	3 10 9	3 13 0	4 0 0	4 0 0	4 0 0	3 14 6	4 12 6	3 14 3
1940.													
Datia—													
Gram . . .	3 8 6	3 3 9	2 15 6	2 9 3	2 10 3	2 10 6	2 10 9	2 11 3	2 10 3	2 10 6	2 9 9	2 9 3	2 12 8
Dal . . .	4 14 9	4 10 3	3 15 3	3 10 9	3 10 3	3 8 6	3 10 3	3 10 3	3 10 3	3 13 0	3 10 3	3 10 3	3 13 10

## APPENDIX XLVI.

Wholesale prices of gram and gram products at Bombay.  
(Per maund of 82 2/7 lb.)

—	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Average.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
<b>1937.</b>													
Gram	3 6 0	3 2 6	3 3 2	3 5 1	3 3 10	3 4 3	3 6 10	3 7 3	3 7 9	3 6 10	3 4 3	3 7 9	3 5 6
Dal	3 5 5	3 5 1	3 8 7	3 7 11	3 10 4	3 11 8	3 12 11	3 14 8	3 14 8	3 12 6	3 12 1	3 11 8	3 10 8
Baisin	3 8 3	3 12 5	3 12 5	3 15 0	3 15 5	4 0 8	3 15 0	3 15 5	3 14 2	3 15 10	3 15 0	3 15 8	3 14 3
<b>1938.</b>													
Gram	3 7 9	3 6 0	3 1 8	2 15 11	3 1 2	3 0 9	3 4 3	3 4 6	3 7 9	3 13 10	3 8 7	3 13 10	3 7 2
Dal	3 11 8	3 10 4	3 10 3	3 7 4	3 10 9	3 11 3	3 13 5	3 14 8	4 0 0	4 6 1	4 5 8	4 7 5	3 14 5
Baisin	4 0 8	4 1 1	3 14 2	3 14 7	4 0 8	4 0 3	4 1 6	4 3 0	4 3 7	4 7 4	4 8 8	4 10 9	4 2 8
<b>1939.</b>													
Gram	3 14 3	3 12 11	3 7 9	3 10 4	3 12 1	3 12 1	3 13 7	3 14 3	4 5 8	4 6 6	4 7 0	5 5 4	4 0 9
Dal	4 13 6	4 9 2	4 8 3	4 8 8	4 13 6	4 9 7	4 8 3	4 10 5	4 13 6	5 2 9	5 7 1	6 2 10	4 15 9
Baisin	5 4 5	5 1 0	4 13 10	4 12 10	4 15 9	4 13 11	4 12 0	4 10 4	5 4 10	5 4 5	5 6 1	6 1 7	5 1 9
<b>1940.</b>													
Gram	5 1 0	4 5 8	4 6 1	4 3 1	4 5 3	4 3 3	4 0 10	4 5 8	4 6 4	4 6 4	4 9 2	4 9 2	4 5 8
Dal	5 11 10	5 6 2	5 3 11	5 1 10	5 8 10	5 1 10	4 14 4	5 4 10	5 3 11	5 6 2	5 4 5	4 15 8	5 4 8
Baisin	6 0 6	5 7 9	5 9 9	5 6 6	5 4 5	5 3 7	5 4 0	5 0 4	5 1 10	5 5 8	5 6 1	5 3 2	5 5 10
<b>1941.</b>													
Gram	4 4 4	4 8 3	4 3 1	4 0 5	3 15 9	3 12 9	4 2 7	4 10 0	4 10 11	4 7 7	4 11 7	5 5 1	4 6 11
Dal	4 11 9	4 13 6	4 10 0	4 6 9	4 7 8	4 10 8	4 12 2	5 7 1	5 5 4	5 2 1	5 4 0	5 14 3	4 15 6
Baisin	5 0 7	4 14 11	4 13 8	5 0 5	5 2 8	5 3 7	4 14 11	5 6 3	5 11 5	5 11 6	6 0 1	6 13 5	5 6 5
<b>1942.</b>													
Gram	5 0 1	5 1 10	5 4 0	5 12 1	5 8 1	6 8 1	6 11 6	7 9 3	6 5 0	6 5 0	10 9 11	11 6 3	6 13 5
Dal	5 12 7	6 0 2	6 4 2	7 3 7	7 6 7	7 7 4	7 8 7	7 13 7	7 11 10	7 14 9	13 4 8	12 14 4	8 1 10
Baisin	6 7 11	6 6 10	7 0 0	7 15 8	8 4 4	9 2 5	8 11 2	10 0 4	10 12 10	11 7 9	12 4 10	13 1 10	9 5 1

## APPENDIX XLVII.

Wholesale prices of gram and gram products at Ahmedabad.

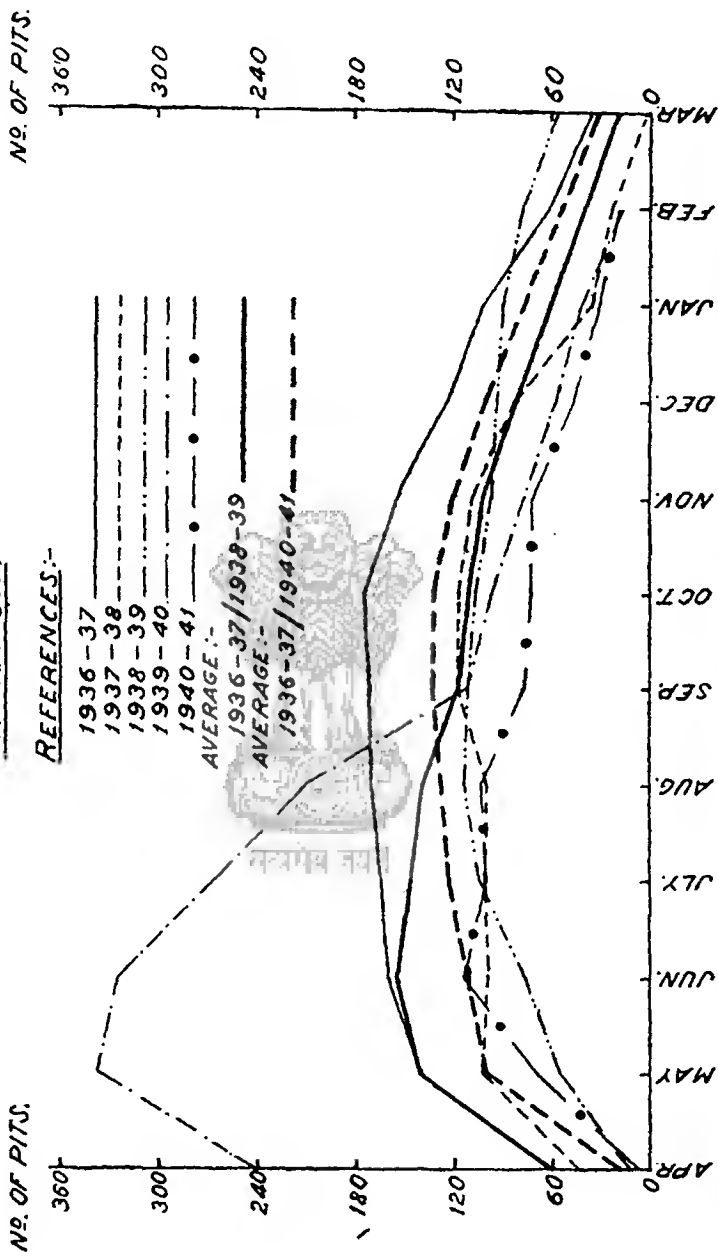
(Per maund of 82 2/7 lb.)

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Average.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
1937													
Gram	2 12 4	2 13 8	2 12 6	2 13 4	2 11 4	3 0 1	3 0 1	3 1 3	3 0 8	3 0 6	3 3 3	3 3 6	2 15 4
Dal .	4 6 9	4 1 8	4 2 1	4 2 9	4 3 4	4 3 4	4 3 4	4 3 4	4 3 4	4 3 4	4 3 4	4 3 4	4 3 1
Batain	4 3 4	4 0 10	4 0 10	4 1 8	4 3 4	4 4 3	4 4 3	4 6 9	4 6 9	4 6 9	4 6 9	4 3 4	4 4 0
Choomi	2 6 0	2 5 3	2 5 0	2 11 2	2 9 0	2 8 0	2 7 6	2 5 0	2 5 0	2 5 0	2 5 0	2 3 0	2 6 3
Husk	1 0 6	0 15 4	0 15 4	1 2 0	1 2 0	1 0 6	0 15 9	0 13 6	0 13 6	0 13 6	0 15 0	0 15 0	0 15 5
1938													
Gram	3 3 3	3 2 3	3 2 0	3 0 0	3 2 0	3 4 0	2 15 0	2 15 0	3 4 6	3 0 8	3 11 0	3 9 0	3 3 1
Dal .	4 0 0	3 14 4	3 13 6	3 12 8	3 12 8	3 12 8	4 0 0	4 3 4	3 9 3	4 13 6	4 11 9	4 13 4	4 1 9
Batain	4 3 4	4 0 0	3 14 4	3 12 8	3 12 8	3 12 8	4 1 8	4 5 0	4 5 6	4 15 2	4 13 6	4 14 4	4 3 11
Choomi	2 3 0	2 6 0	2 6 0	2 5 6	2 5 0	2 5 0	2 4 0	2 4 0	2 5 9	2 10 0	2 9 6	2 11 0	2 6 9
Husk	0 15 0	0 15 0	0 15 0	0 15 0	0 15 0	1 3 6	0 13 6	0 13 6	0 15 0	1 0 6	1 0 0	0 15 9	0 15 3
1939													
Gram	3 11 0	3 14 0	4 0 6	4 1 0	4 1 0	3 16 0	3 15 0	4 1 0	4 2 0	4 7 6	4 9 0	5 1 0	4 2 6
Dal .	5 0 10	5 0 10	5 0 10	5 0 10	5 3 4	5 4 3	5 4 3	5 5 11	5 10 11	5 14 4	6 3 4	6 11 9	5 7 9
Batain	4 15 2	4 13 5	4 13 5	5 0 10	5 3 4	5 4 3	5 4 3	5 5 11	5 10 11	5 14 4	6 3 4	6 11 9	5 7 11
Choomi	2 13 6	2 12 0	2 12 0	2 10 0	2 10 0	2 10 0	2 10 0	3 0 0	3 3 6	3 5 0	3 6 0	3 11 0	2 15 2
Husk	1 0 0	1 0 6	1 0 6	0 13 6	0 13 6	0 13 6	0 13 6	1 2 0	1 2 9	1 3 6	1 7 3	1 8 0	1 1 3
1940													
Gram	5 1 0	5 2 0	4 6 0	4 1 0	3 15 0	4 1 0	3 15 0	4 0 6	4 1 0	4 3 9	4 3 0	4 3 6	4 4 5
Dal .	6 4 3	5 12 8	5 10 11	5 7 7	4 11 9	4 11 9	5 7 7	5 7 7	5 9 3	5 10 11	5 10 11	5 7 7	5 8 1
Batain	6 4 3	5 12 8	5 10 11	5 7 7	5 7 7	5 7 7	5 9 3	5 9 3	5 9 3	5 10 11	5 10 11	5 7 7	5 10 4
Choomi	3 5 3	3 3 0	3 2 0	2 14 0	2 14 0	2 14 0	3 0 0	3 0 0	2 10 0	2 10 0	2 11 0	2 10 6	2 14 6
Husk	1 5 1	1 5 9	1 5 9	1 2 0	1 2 0	1 2 0	0 15 0	0 15 0	0 15 0	0 15 0	0 15 0	1 0 6	1 1 6
1941													
Gram	3 14 0	3 11 6	3 11 6	3 6 6	3 5 6	3 5 6	3 11 3	4 5 6	4 5 6	4 4 9	3 14 3	4 2 3	3 13 6
Dal .	5 12 0	5 10 0	5 10 0	5 12 0	5 10 0	5 8 0	5 12 0	6 0 0	6 0 0	5 12 0	5 10 0	5 13 0	5 11 9
Batain	5 6 6	5 4 6	5 4 6	5 4 0	5 4 0	5 4 0	5 5 0	5 14 0	5 15 6	5 15 6	5 14 0	6 3 0	5 9 3
Choomi	2 5 0	2 11 0	2 10 6	2 9 0	2 6 0	2 5 9	2 5 6	2 5 6	2 6 6	2 6 6	2 7 0	3 1 0	2 7 11
Husk	1 12 4	1 12 8	2 0 0	1 12 8	1 11 4	1 12 0	2 3 4	2 3 4	2 1 8	2 1 8	1 15 10	2 0 0	1 15 3

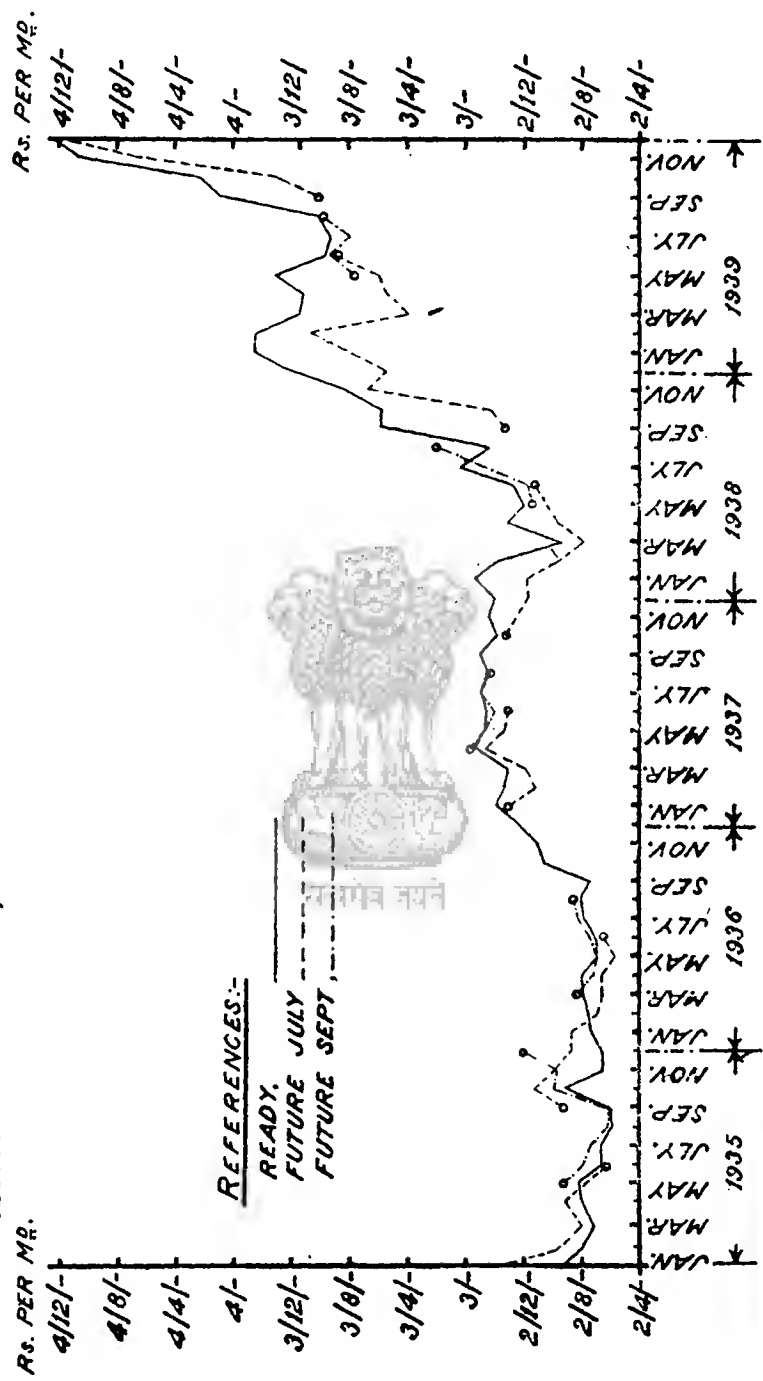


GRAPH SHOWING THE MONTHLY STOCKS IN KHATTIS (PITS).

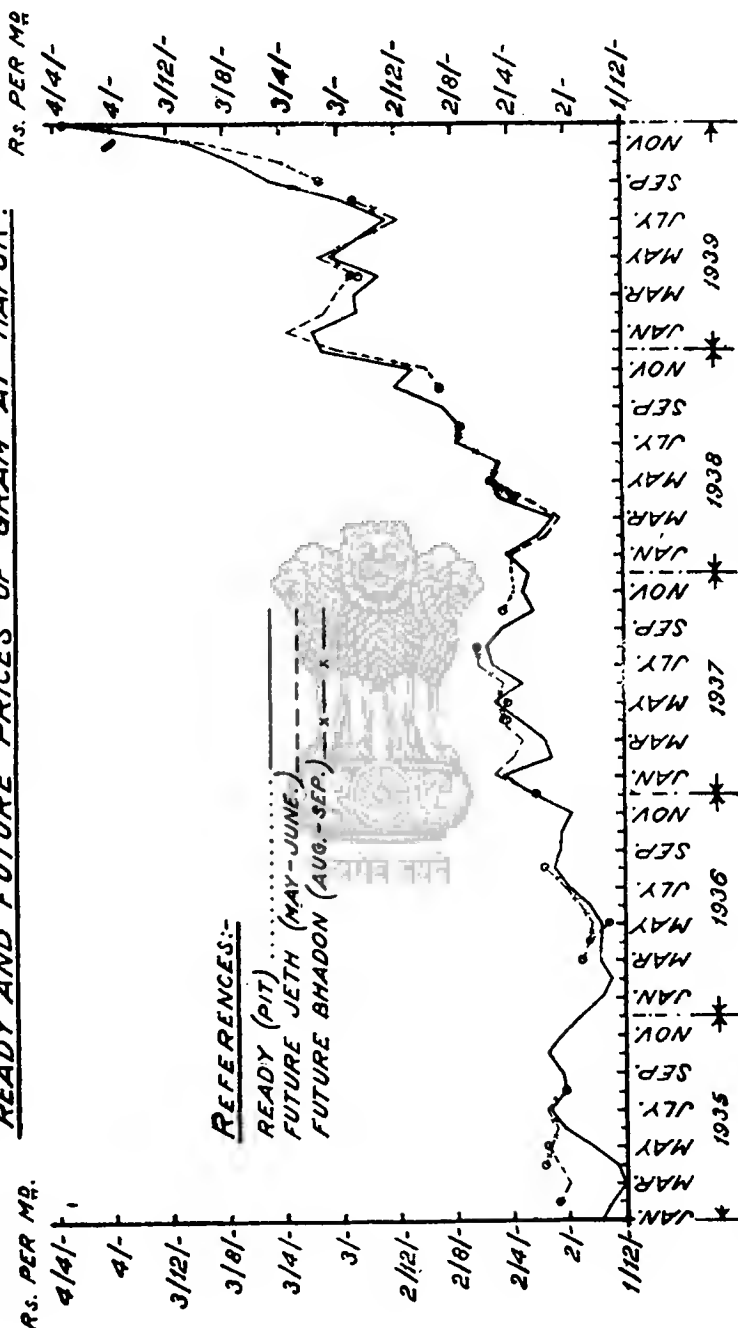
AT HAPUR.



READY  
AND FUTURE PRICES OF YELLOW GRAM AT KARACHI



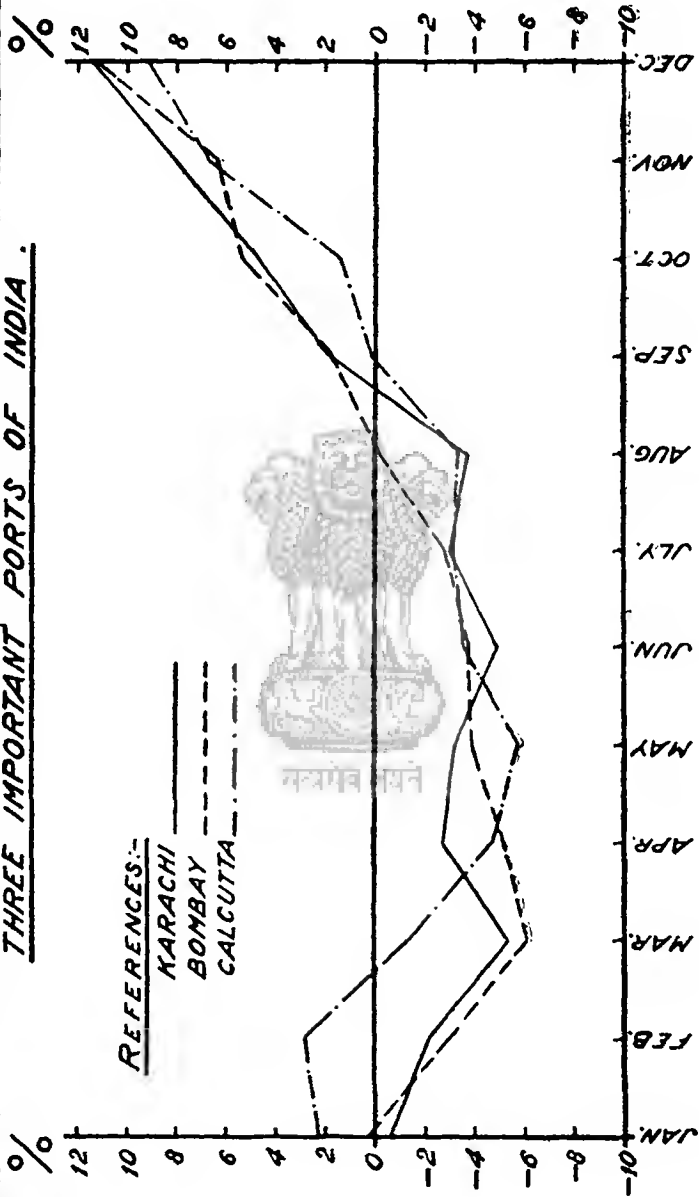
# READY AND FUTURE PRICES OF GRAM AT HAPUR.



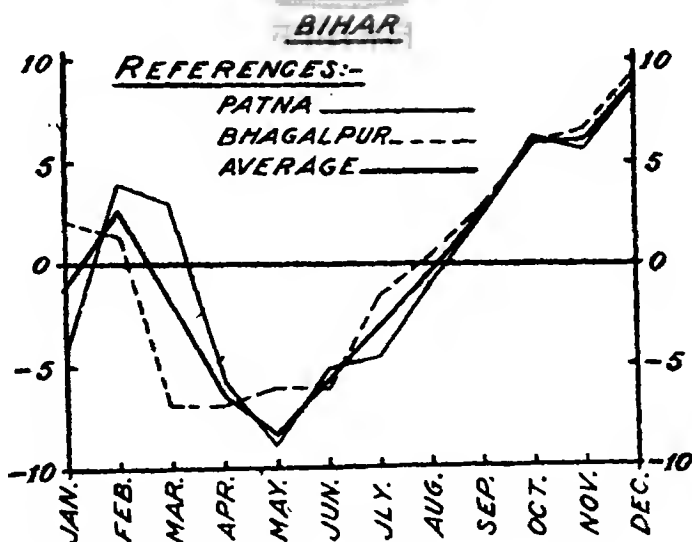
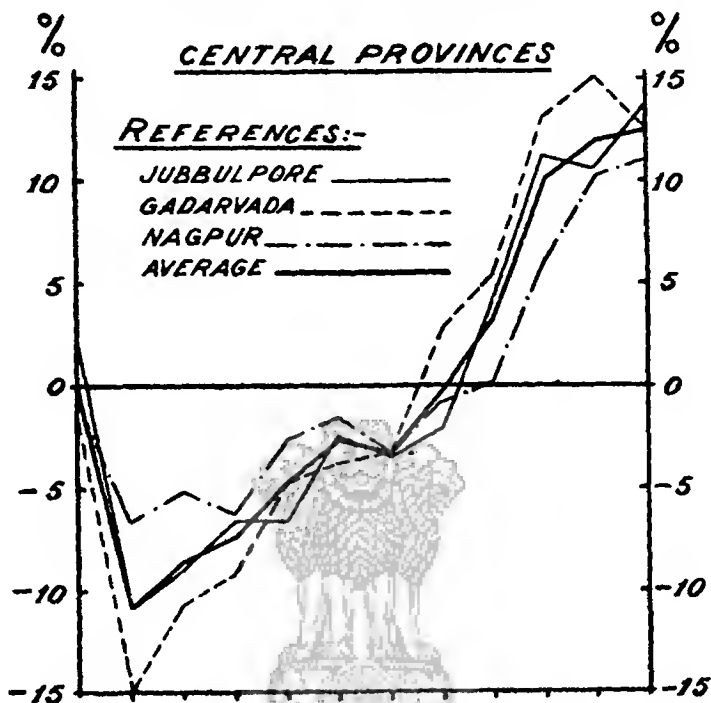
## REFERENCES:-

- READY (PIT) .....
- FUTURE JETH (MAY-JUNE) - - - - -
- FUTURE BHADON (AUG.-SEP.) . . . . .

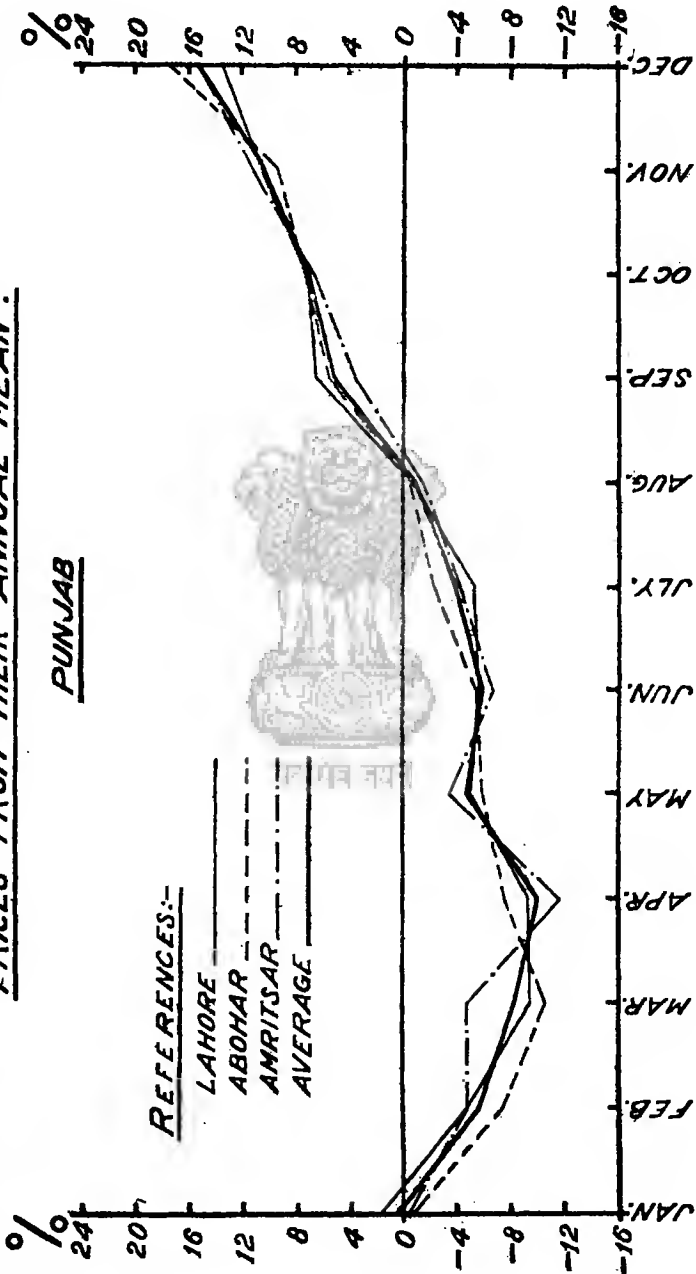
**PERCENTAGE DEVIATION OF MONTHLY WHOLESALE PRICES OF GRAM AT  
THREE IMPORTANT PORTS OF INDIA.**

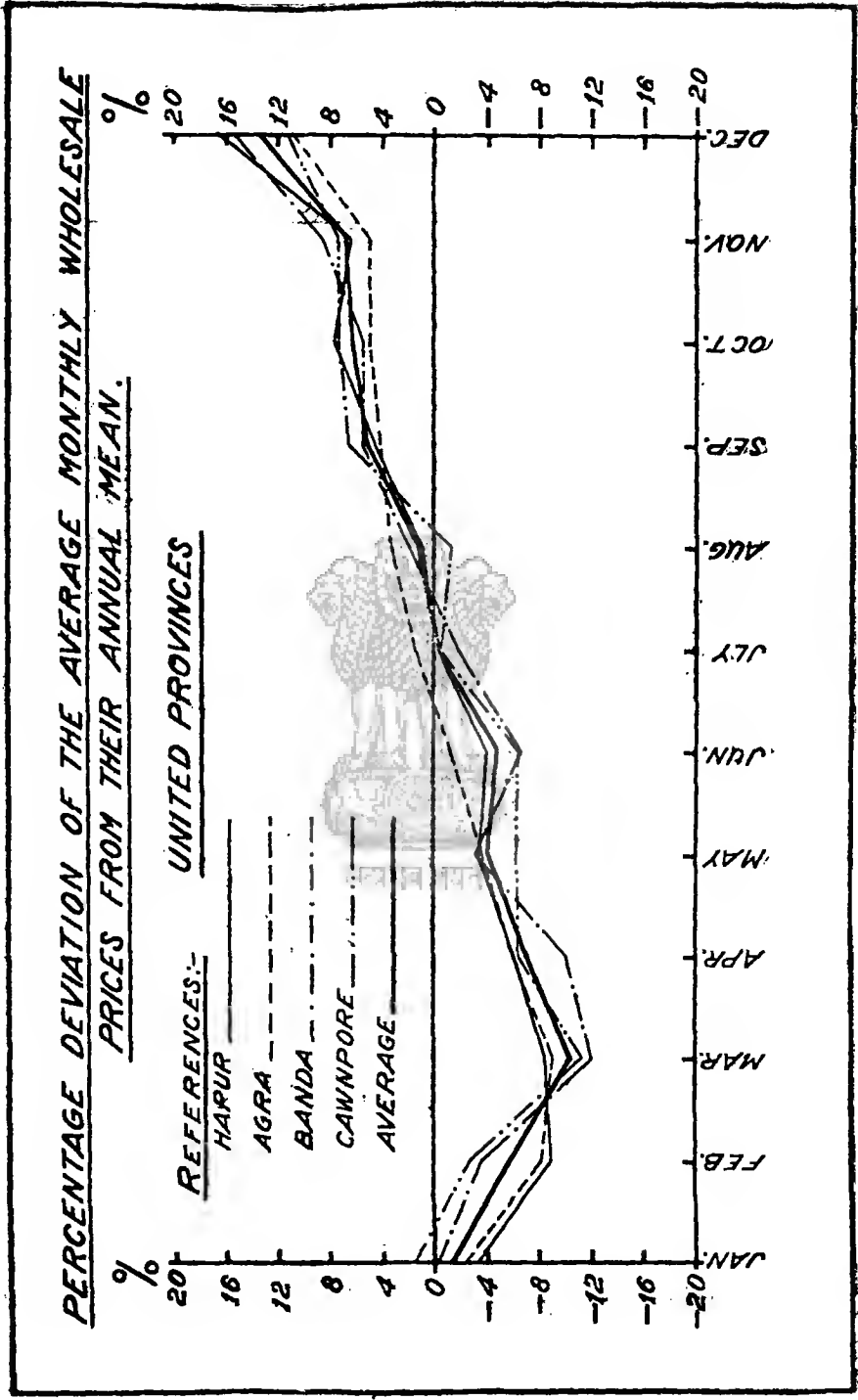


**PERCENTAGE DEVIATION OF THE AVERAGE  
MONTHLY WHOLESALE PRICES FROM  
THEIR ANNUAL MEAN.**



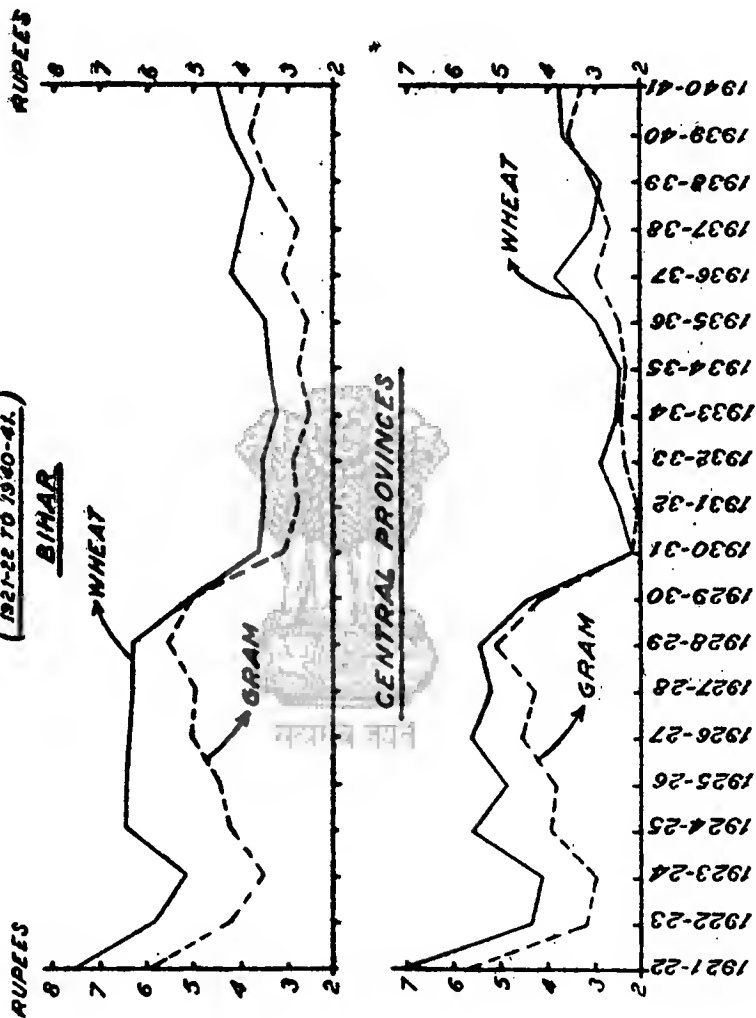
**PERCENTAGE DEVIATION OF THE AVERAGE MONTHLY WHOLESALE  
PRICES FROM THEIR ANNUAL MEAN.**





# COMPARATIVE HARVEST PRICES OF WHEAT AND GRAM IN BIHAR AND CENTRAL PROVINCES.

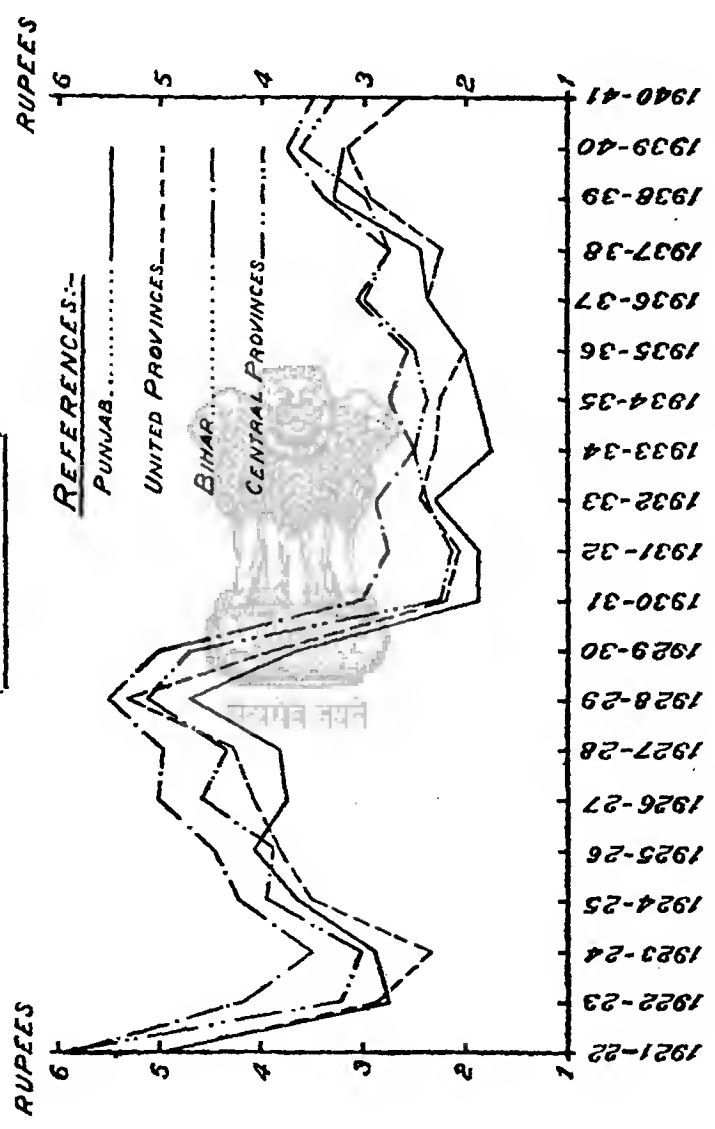
(1921-22 TO 1940-41.)

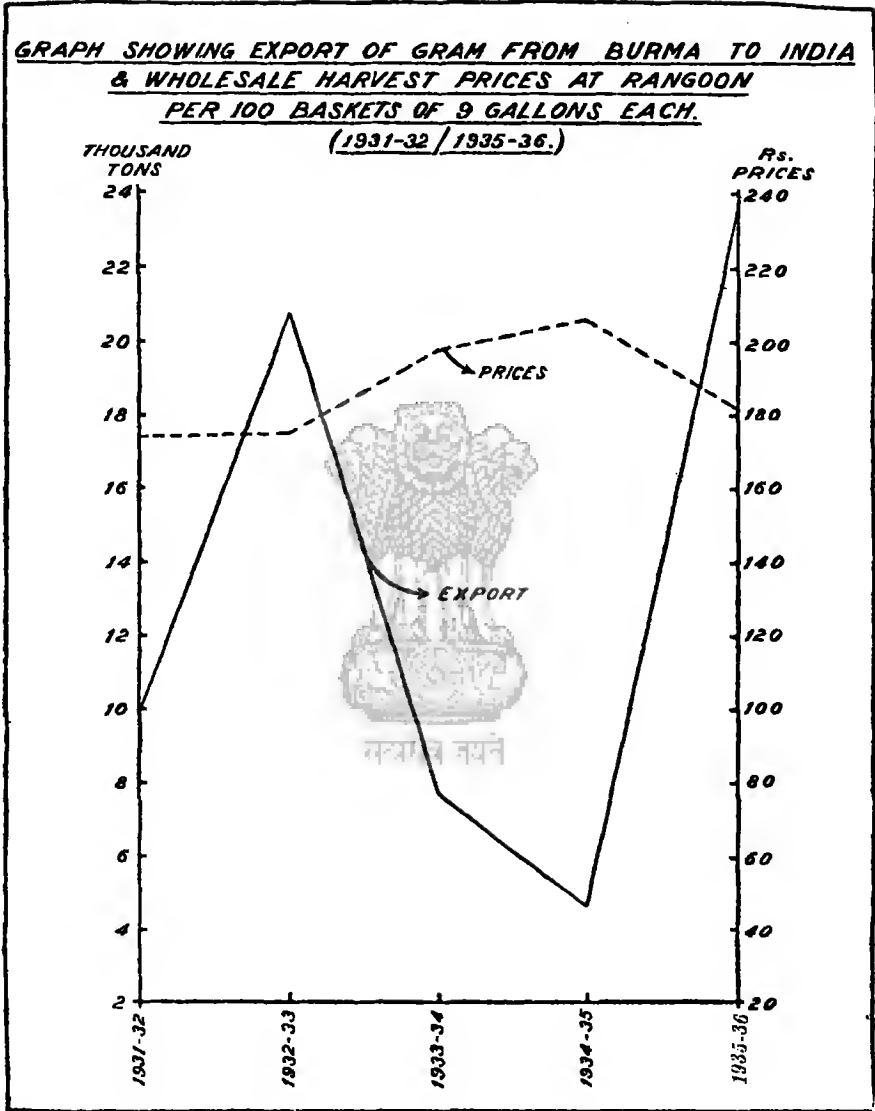




HARVEST PRICES OF GRAM IN THE MAIN PRODUCING PROVINCES.

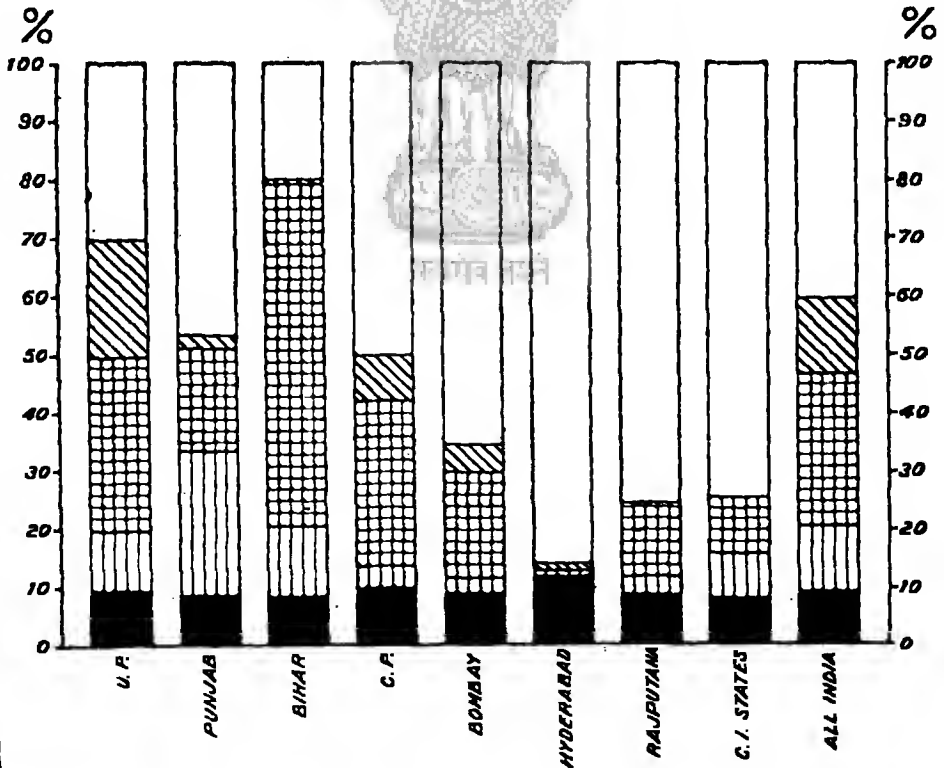
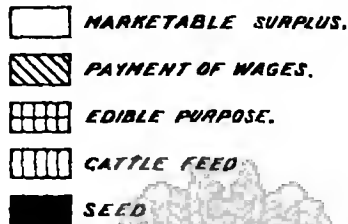
(1921-22 TO 1940-41.)





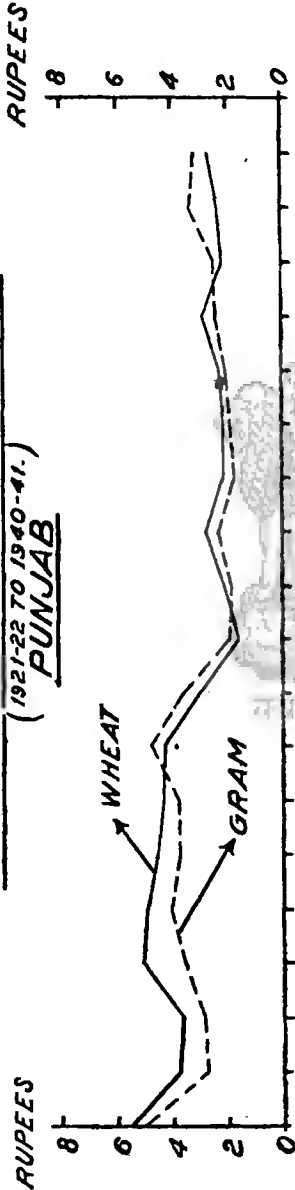
**DIAGRAM SHOWING THE PERCENTAGE RETENTION AND  
MARKETABLE SURPLUS OF THE GRAM CROP  
IN IMPORTANT PRODUCING  
TRADE BLOCKS.**

**REFERENCES:—**

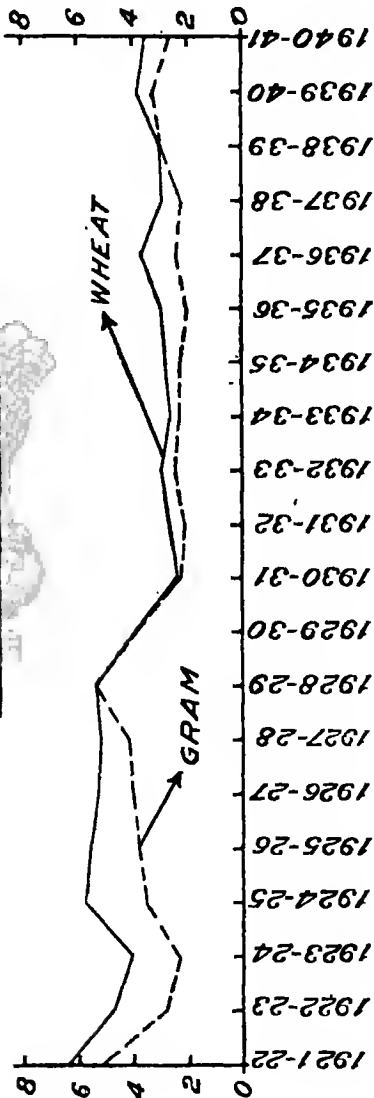


COMPARATIVE HARVEST PRICES OF WHEAT AND GRAM IN THE  
PUNJAB & UNITED PROVINCES.

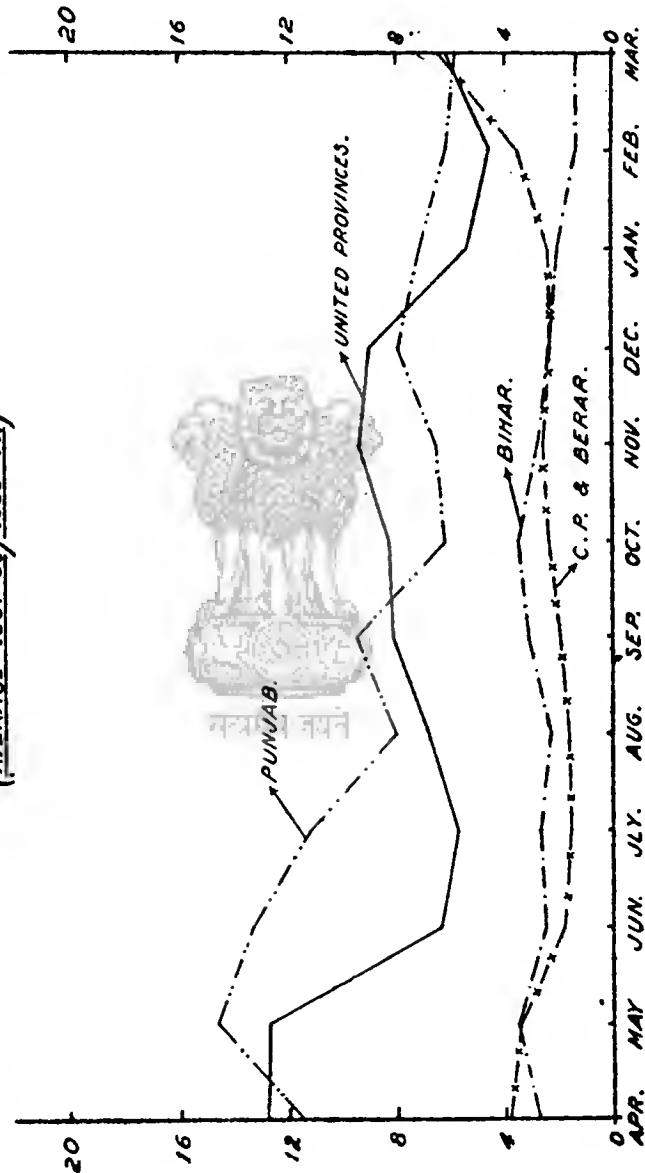
(1921-22 TO 1940-41.)  
PUNJAB

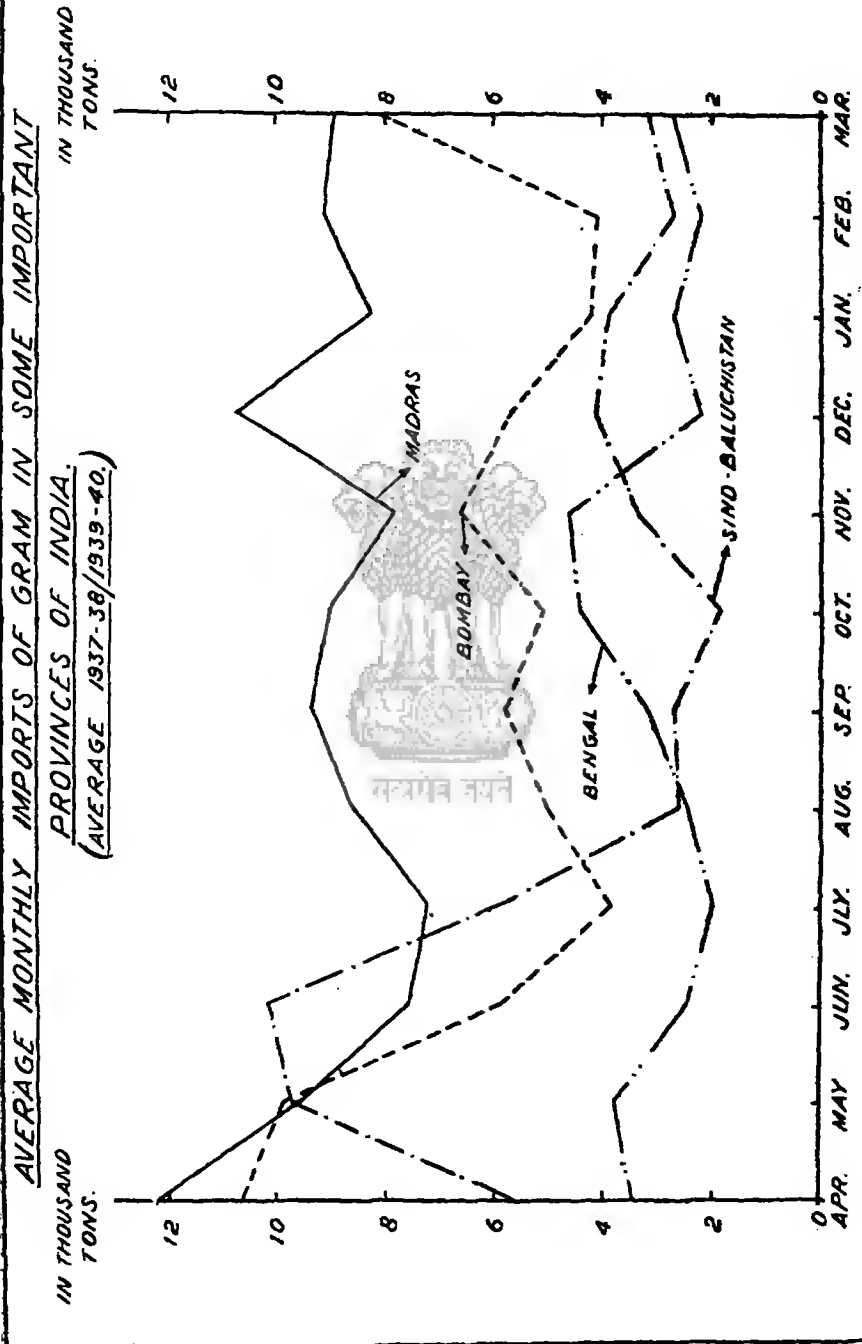


UNITED PROVINCES



AVERAGE MONTHLY EXPORTS OF GRAM BY RAIL & RIVER FROM  
THE CHIEF PRODUCING PROVINCES IN INDIA,  
(AVERAGE-1937-38/1939-40.)  
IN THOUSAND TONS.

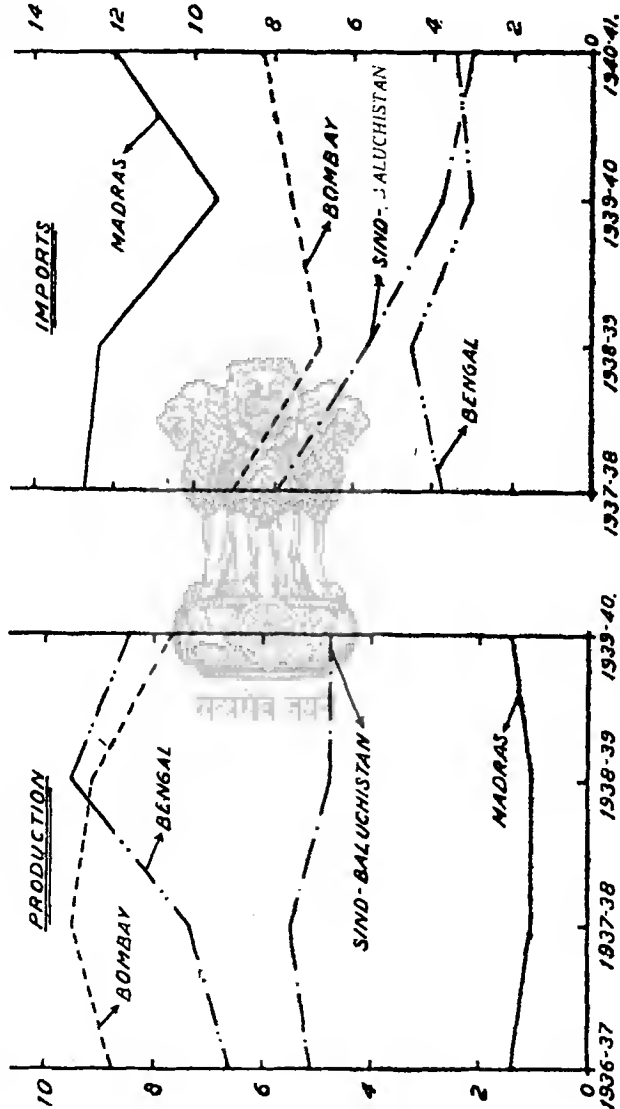




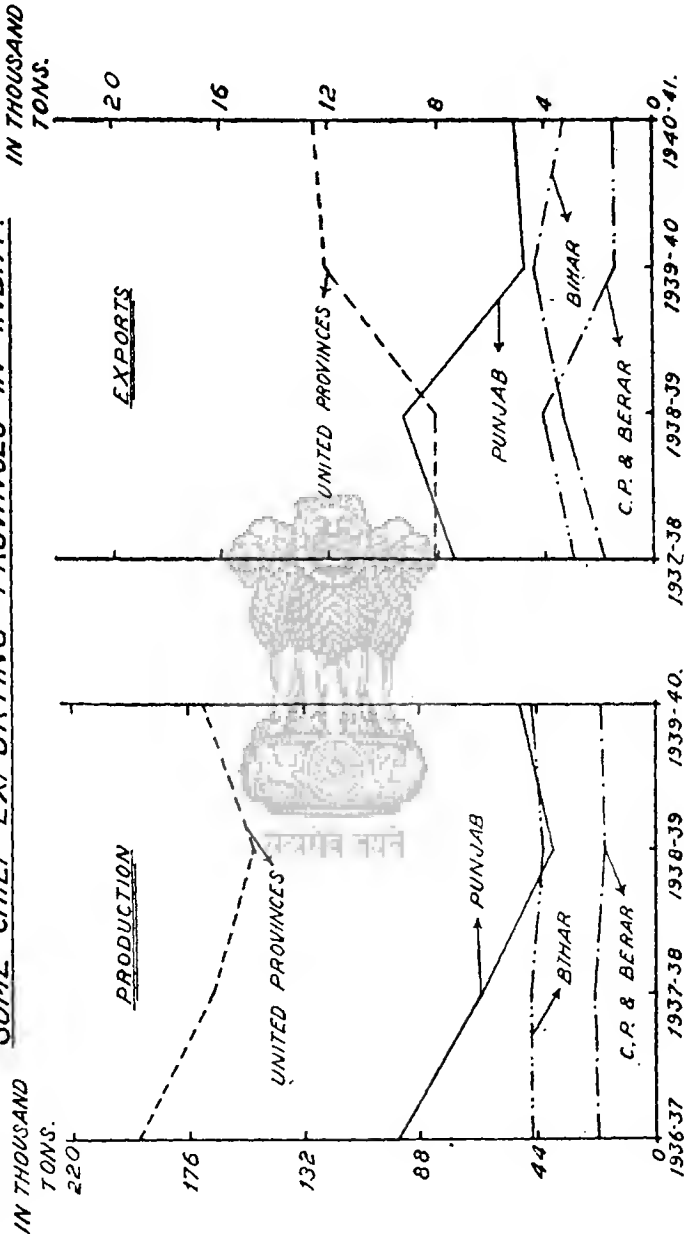
# YEARLY PRODUCTION AND IMPORTS OF GRAM IN SUBSEQUENT YEARS IN SOME CHIEF IMPORTING PROVINCES IN INDIA.

IN THOUSAND  
TONS.

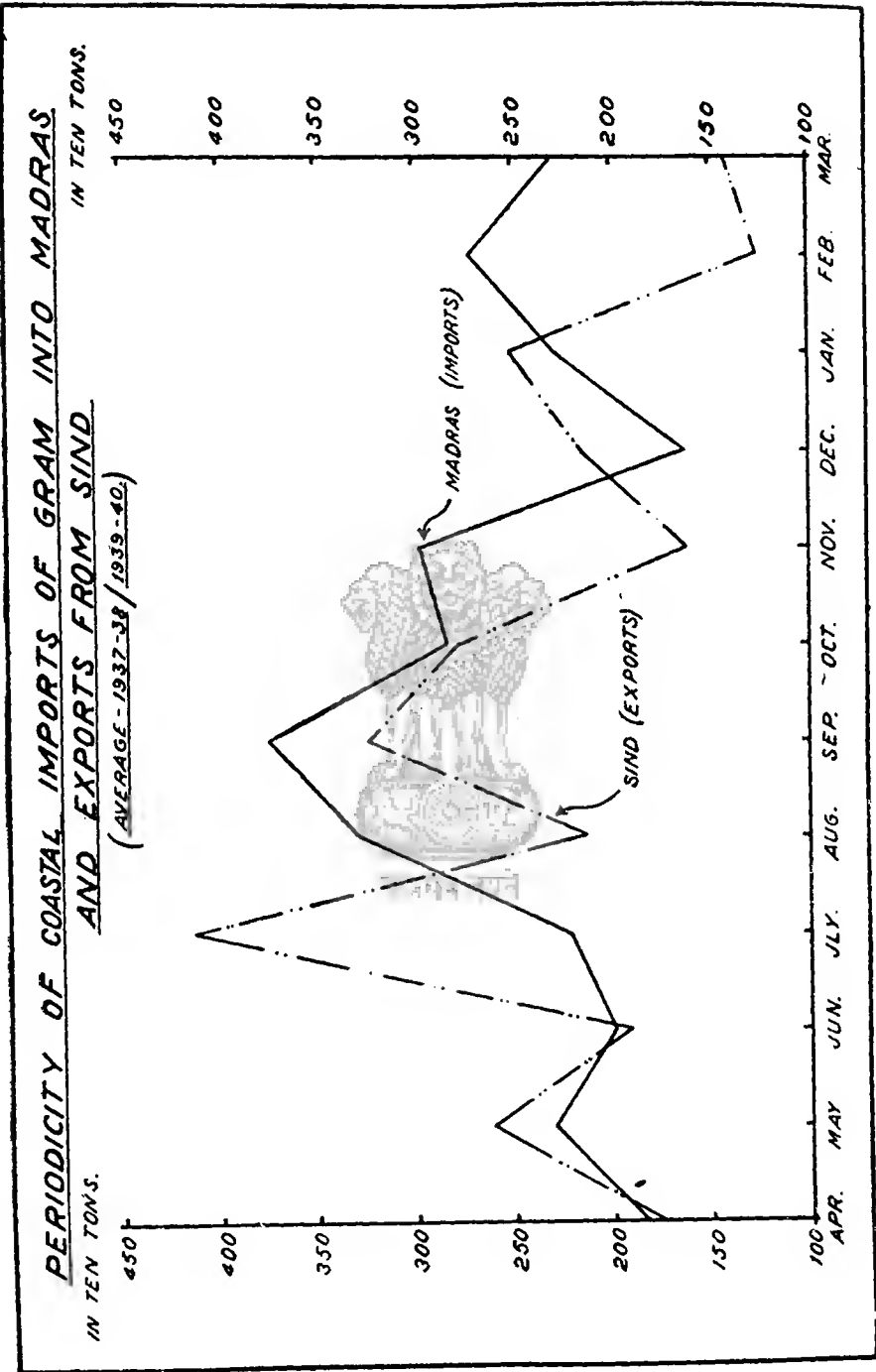
IN THOUSAND  
TONS.



# YEARLY PRODUCTION AND EXPORTS OF GRAM IN SUBSEQUENT YEARS IN SOME CHIEF EXPORTING PROVINCES IN INDIA.







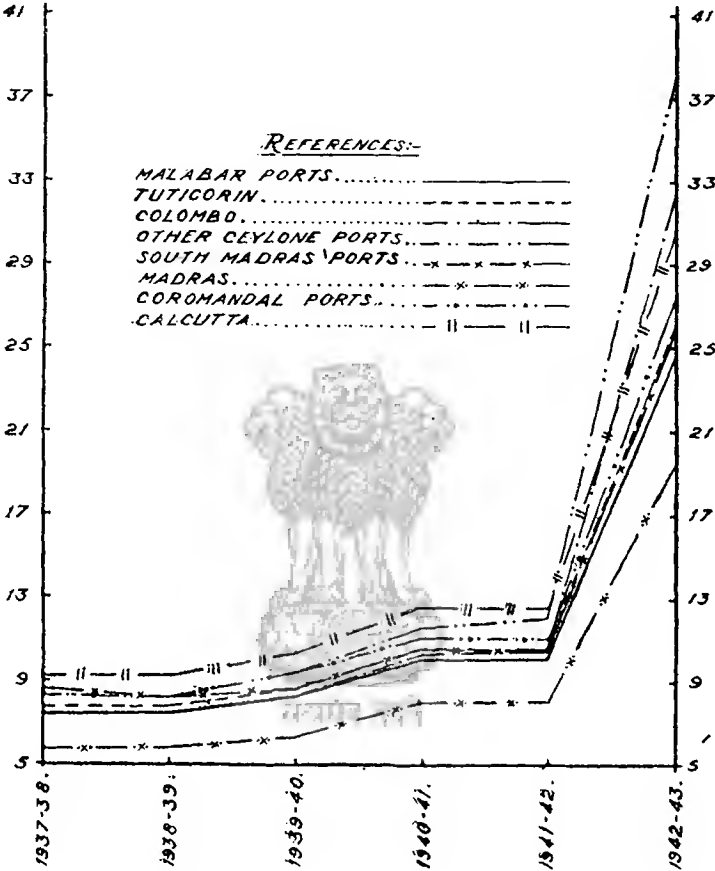
COASTAL FREIGHT RATES ON GRAM BETWEEN KARACHI & IMPORTANT INDIAN PORTS.

Rs. PER TON.

Rs. PER TON.

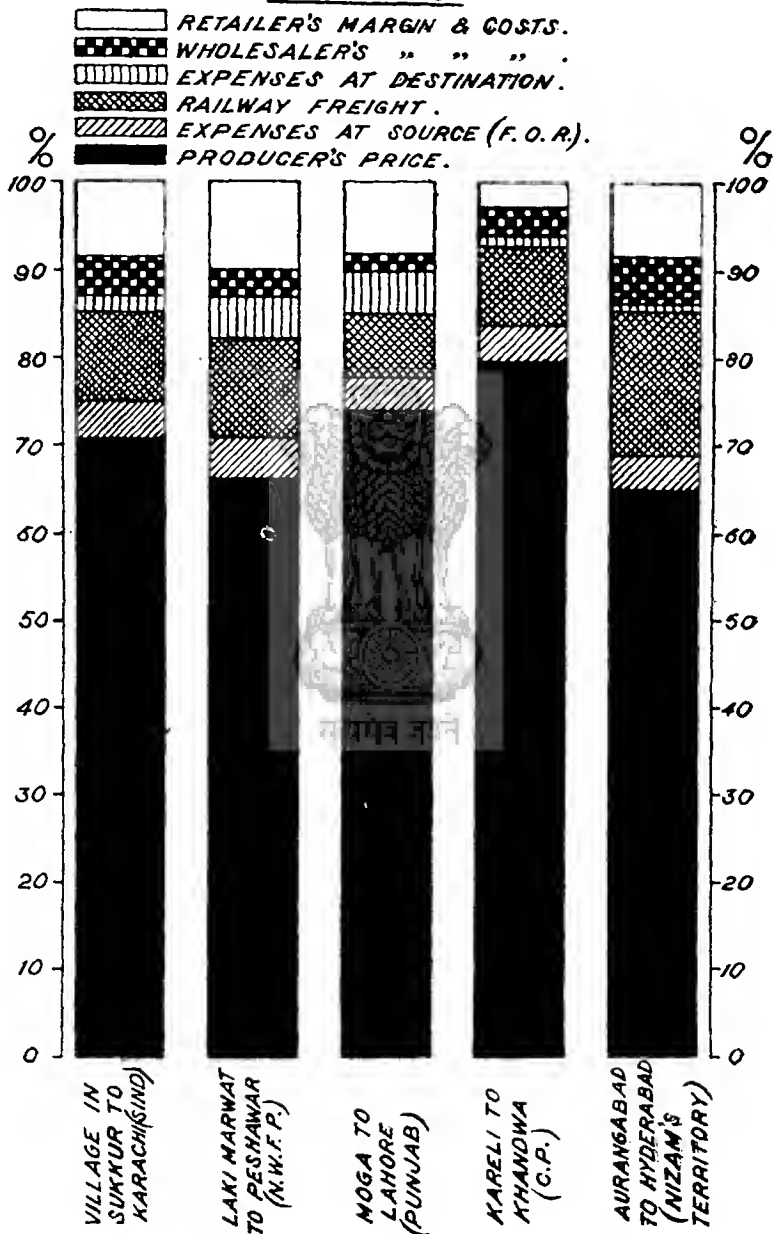
REFERENCES:-

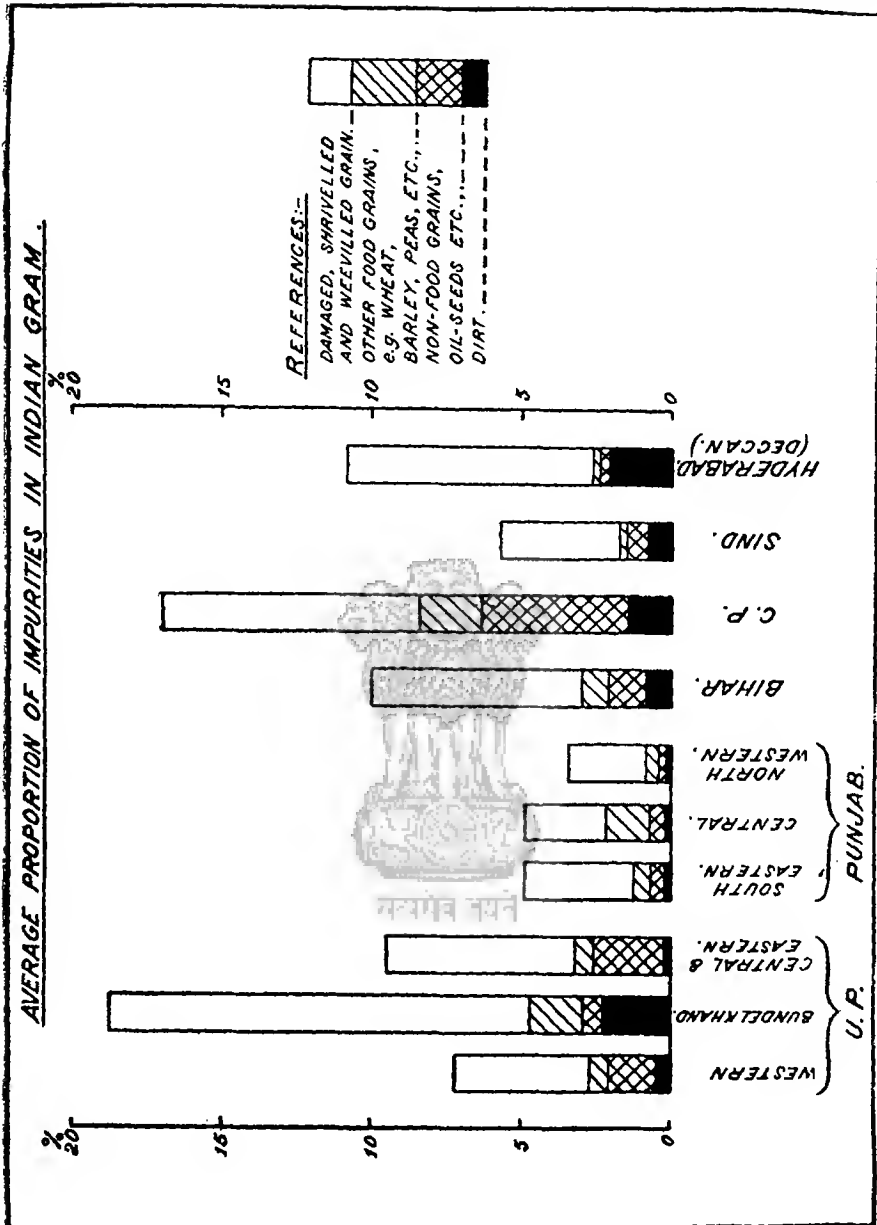
MALABAR PORTS.....  
TUTICORIN.....  
COLOMBO.....  
OTHER CEYLONE PORTS.....  
SOUTH MADRAS PORTS.....  
MADRAS.....  
COROMANDAL PORTS.....  
CALCUTTA.....

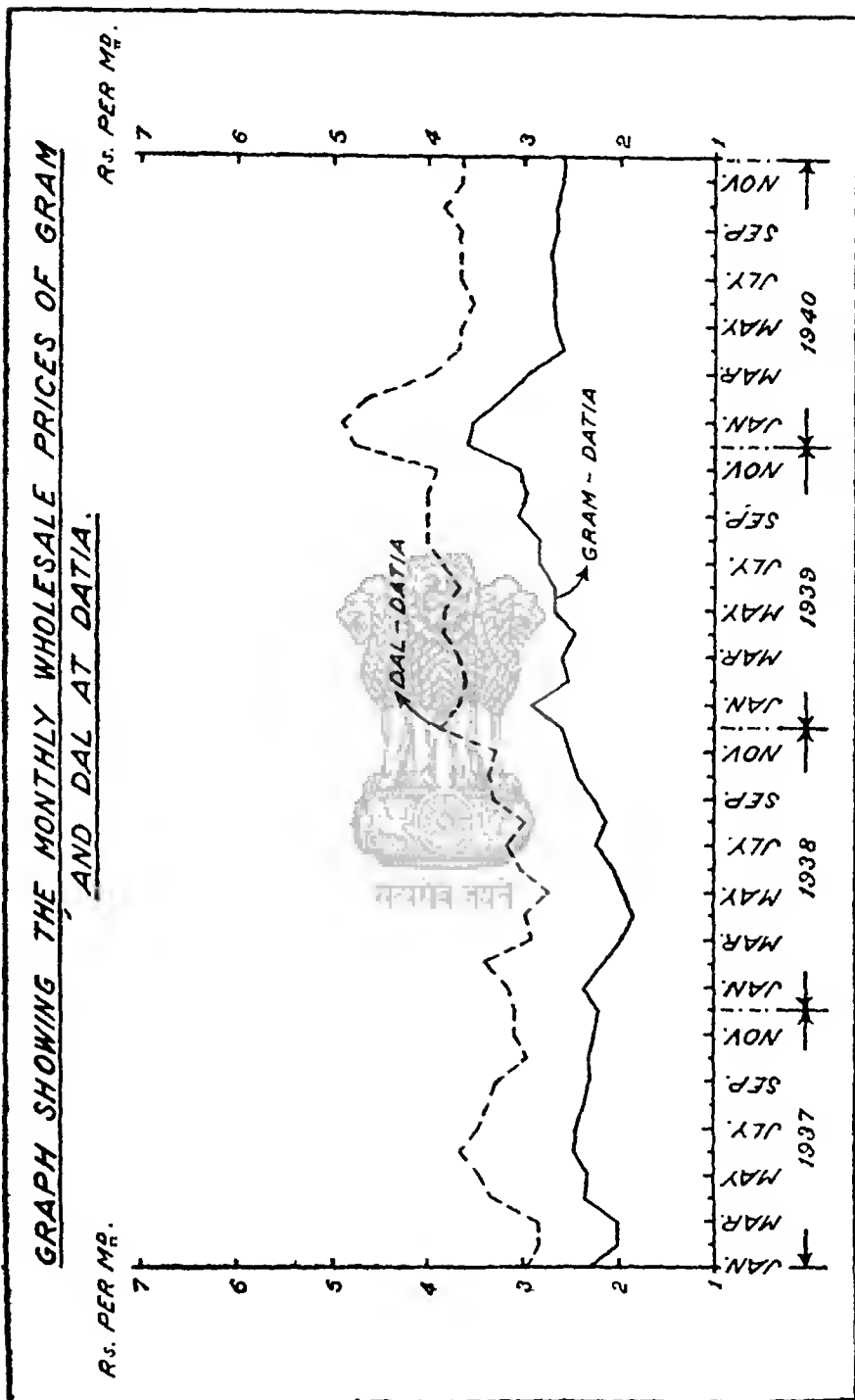


# PRICE SPREADS BETWEEN SOME PRODUCING AND CONSUMING CENTRES .

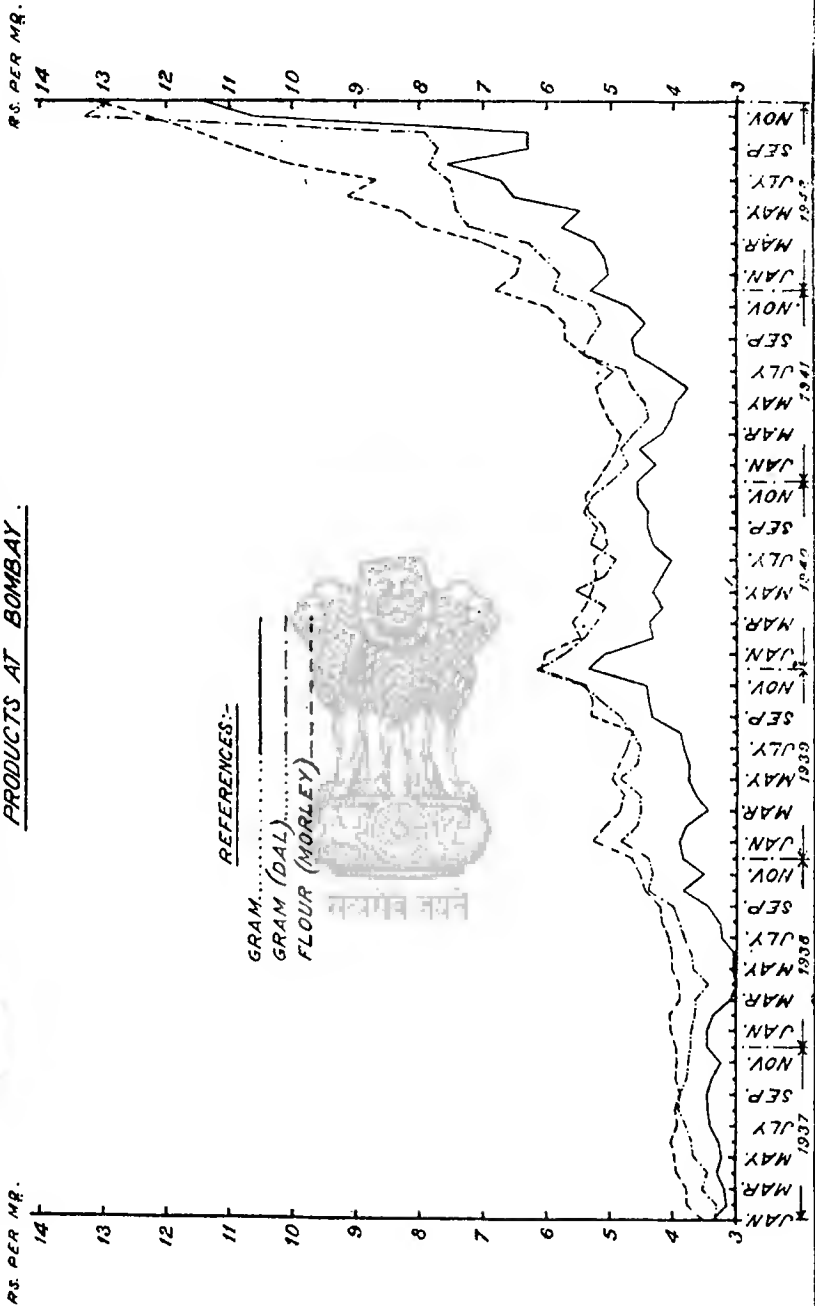
## REFERENCES:-

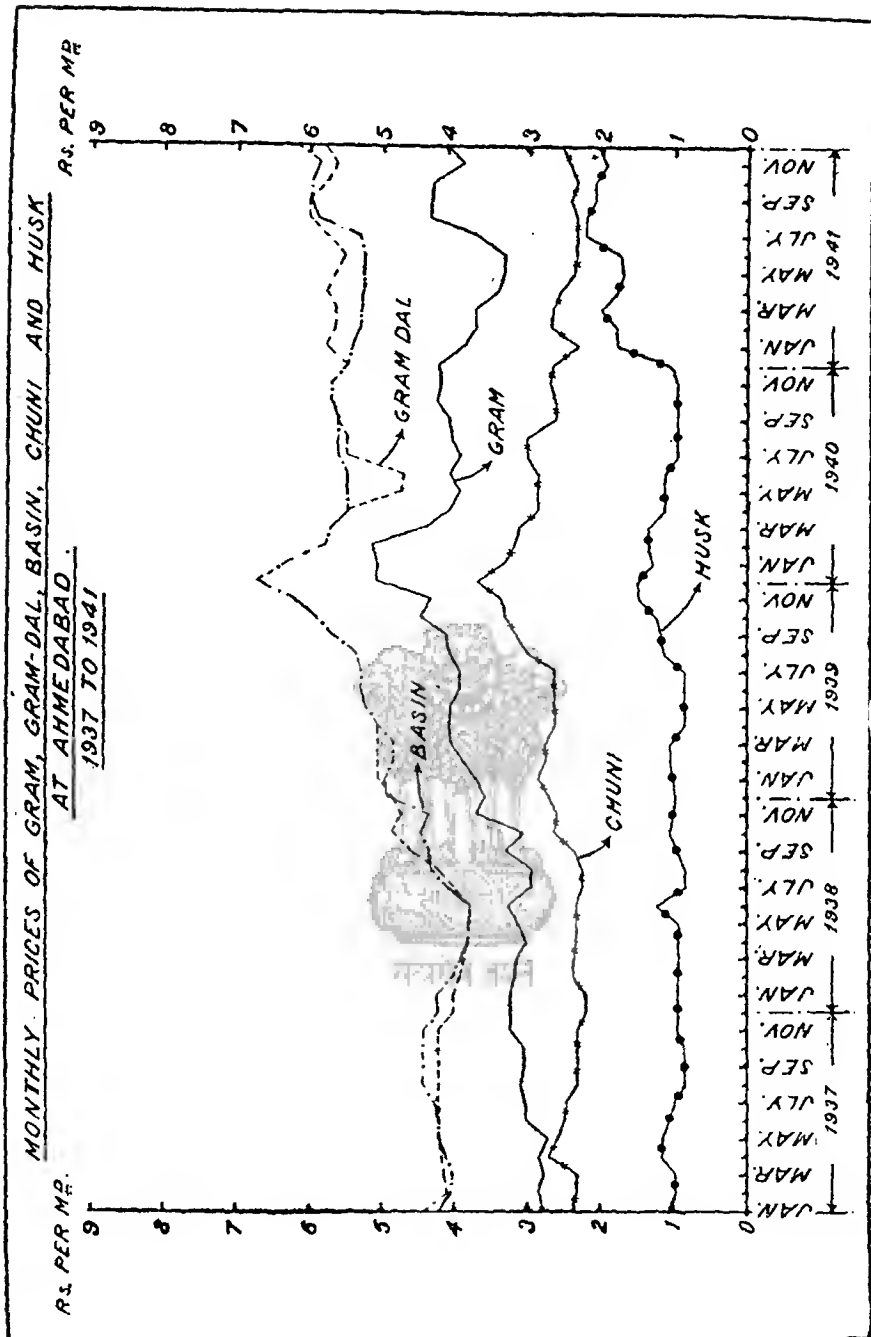


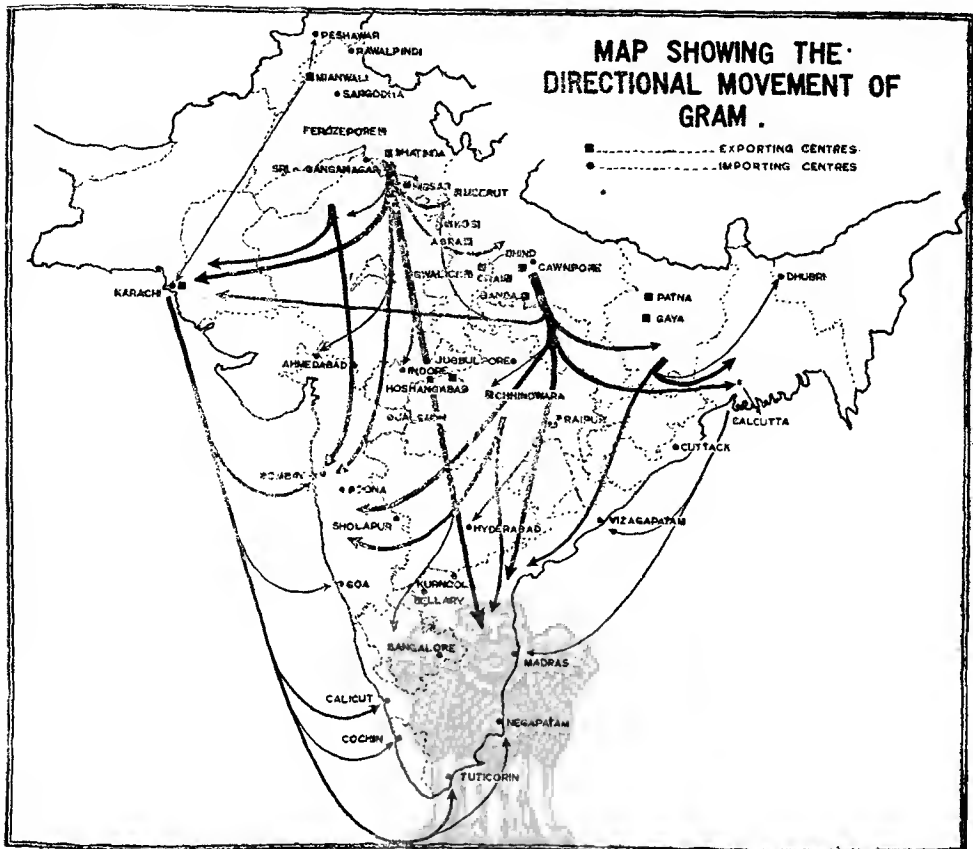




GRAPH SHOWING THE MONTHLY PRICES OF GRAM AND  
PRODUCTS AT BOMBAY.









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